

# New records of Braconinae (Hymenoptera, Braconidae) from South Korea

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Academic editor: J. Fernandez-Triana | Received 19 January 2021 | Accepted 19 March 2021 | Published 28 June 2021

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<http://zoobank.org/3F3A83D4-9079-476E-AE59-FCE2E7EFEABF>

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**Citation:** Samartsev K, Ku D-S (2021) New records of Braconinae (Hymenoptera, Braconidae) from South Korea. Journal of Hymenoptera Research 83: 21–72. <https://doi.org/10.3897/jhr.83.63353>

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## Abstract

Two genera (*Campyloneurus* Szépligeti and *Craspedolcus* Enderlein) and 31 species of Braconinae are recorded for the first time from South Korea, including one new subspecies (*Bracon albion continentalis* **ssp. nov.**). Two new synonyms are proposed: *Bracon leptotes* Li, He & Chen, 2020, **syn. nov.** (= *B. (Bracon) semitergalis* Tobias, 2000) and *B. megaventris* Li, He & Chen, 2020, **syn. nov.** (= *B. (B.) terebralis* Tobias, 2000). For all species with problematic identification descriptions, diagnoses and illustrations are provided.

## Keywords

New record, new subspecies, new synonym, Palearctic

## Introduction

Braconinae are the largest subfamily of the braconid wasps (Yu et al. 2016). The large number of revealed taxa and the lack of adequate literature for identification of most of its species and even genera are complicating the faunistic and taxonomic investigations in the subfamily. The absence of large-scale reviews and revisions of the most common taxa of Braconinae presents a particular difficulty for the study of the East Asian part of the Palearctic region. The current paper provides a contribution to the fauna of the Korean Peninsula.



First-time records of the species of Braconinae from the Korean Peninsula are found in 14 publications. Except for five recent articles (Lee et al. 2018; Papp 2018; Kang et al. 2019; Samartsev and Ku 2020; Yu et al. 2020), most of the significant literature on the fauna of Korea is cited in the Taxapad catalogue (Cushman 1931; Matsumura 1931; Watanabe 1932, 1935; Papp 1996, 1998, 2012; Belokobylskij and Tobias 2000; Ku et al. 2001; all cited by Yu et al. 2016). A total of 93 currently valid species from 17 genera of braconines have been indicated for the Korean Peninsula. It is notable that 70 species were added by Jenő Papp, mostly on the basis of the material from North Korea. The fauna of South Korea has been less explored.

The present study is based on an extensive collection of Braconinae of South Korea accumulated by the second author. Involving the type material on the species described from the Russian Far East and information on braconines recently described from China and Japan, we add 31 species and 2 genera (*Campyloneurus* Szépligeti and *Craspedolcus* Enderlein) to the known fauna of the region. One of the reported species previously known from Europe differs enough to be described as a new subspecies (*Bracon albion continentalis* ssp. nov.).

In recent years, knowledge about the Braconinae of China develops rapidly (for example, Li et al. 2016, 2020a, b, c). Due to incompleteness or inaccessibility of information about most of the known species of the subfamily and lack of reliable keys, the risks of misidentification or description of synonymous species during this work are high. For example, two recently described species from China are found to be junior synonyms of species presented in the current article. We provide illustrated descriptions for the species of Braconinae from the East Palaearctic region originally briefly described in Russian (Tobias and Belokobylskij 2000) and for some widely distributed, but complicated in identification species.

## Material and methods

### Terminology

Morphological nomenclature follows Quicke (1987) and van Achterberg (1993); the transverse pronotal sulcus is included after Karlsson and Ronquist (2012). The length of fifth segment of hind tarsus is measured without its pretarsus; first metasomal tergite is measured from its articulating condyle [term applied after Vilhelmsen et al. (2010)].

Abbreviations of morphological terms:

<b>Od</b>	maximum diameter of lateral ocellus;
<b>OOL</b>	ocular-ocellar distance;
<b>POL</b>	postocellar distance.

Museum acronyms:

**HNHM** Hungarian Natural History Museum (Budapest, Hungary);



- IRSNB** Royal Belgian Institute of Natural Sciences (Brussels, Belgium);  
**NIBR** National Institute of Biological Resources (Incheon, South Korea);  
**RMNH** Naturalis Biodiversity Centre (Leiden, Netherlands);  
**SMNE** Science Museum of Natural Enemies (Geochang, South Korea);  
**ZISP** Zoological Institute of the Russian Academy of Sciences (Saint Petersburg, Russia);  
**ZMLU** Lund Museum of Zoology, Lund University (Lund, Sweden).

**List of collection localities in South Korea (numbers in brackets correspond to the numbers of points on the map in Fig. 1)**

**Gangwon-do** • Goseong-gun: [1] Hyeonnae-myeon, Baebong-ri; [2] Ganseong-eup; [4] Jinbu-ri; [3] Geojin-eup, Naengcheon-ri, Geonbongsa Temple; [5] Toseong-myeon, Sinpyeong-ri, Seoraksan Mountain (Sinseonbong, or Sinseon-Peaks) • Sokcho-si: [6] Nohak-dong; [7] Seorak-dong • Yanggu-gun, [8] Bangsan-myeon, Omi-ri • Inje-gun, [9] Inje-eup, Hapgang-ri • Yangyang-gun, [10] Seo-myeon, Galcheon-ri, Yaksusan Mountain • Chuncheon-si, [11] Dongsan-myeon, Joyang-ri, Joyang bridge • Hongcheon-gun: [12] Duchon-myeon; [13] Naechon-myeon, Waya-ri, Baegamsan Mountain • Pyeongchang-gun, [14] Jinbu-myeon, Dongsan-ri, Odaesan Mountain • Donghae-si, [15] Bukpyeong-dong • Hoengseong-gun, [16] Gonggeun-myeon, Hakdam-ri • Yeongwol-gun: [17] Nam-myeon; [18] Hanbando-myeon, Ssangyong-ri; [19] Kimsatgat-myeon, Nae-ri, Town Daeyachi • Taebaek-si: [21] Cheoram-dong; [20] Cheoram-dong, Geumganggol (Geumgang valley); [22] Taebaeksan Mountain.

**Seoul-si** • Gwanak-gu, [23] Shinrim-dong.

**Gyeonggi-do** • Pocheon-si: [24] Idong-myeon, Dopyeong-ri, Valley Baekun; [25] Yeongbuk-myeon, Sanjeong-ri, Lake Sanjeong; [26] Hwahyeon-myeon, Hwahyeon-ri, Unaksan Mountain • Paju-si: [27] Gunnae-myeon, Jeomwon-ri; [28] Munsan-eup, Ma-jeong-ri, Freedom Bridge (pond) • Yangju-si, [29] Nam-myeon • Gapyeong-gun: [30] Buk-myeon, Dodae-ri, Myeongjisan Mountain; Cheongpyeong-myeon: [31] Cheongpyeong-ri, Cheongpyeong Amusement Park; [32] Homyeong-ri, Cheongpyeong Dam; [33] Seorak-myeon, Gail-ri • Yangpyeong-gun, [34] Okcheon-myeon, Yongcheon-ri, Yongmunsan Mountain • Gunpo-si, [35] Sokdal-dong, Surisan Mountain • Suwon-si: [36] Jangan-gu, Pajang-dong, Gwanggyosan Mountain; Gwonseon-gu: [38] Seodun-dong; [37] Yeogisan Mountain • Hwaseong-si, [39] Bibong-myeon.

**Gyeongsangbuk-do** • Bonghwa-gun: [40] Seokpo-myeon, Seokpo-ri; [41] Mulya-myeon, Ojeon-ri, Seondalsan Mountain; [42] Beopjeon-myeon, Eoji-ri, Norujae mountain pass; [43] Myeongho-myeon • Gimcheon-si: [44] Eomo-myeon, Gurye-ri; [45] Daedeok-myeon, Churyang-ri Sudosan Mountain • Yeongcheon-si, [46] Hwabuk-myeon, Sangsong-ri, Nogwijae ridge • Seongju-gun, [47] Suryun-myeon, Bongyang-ri • Gyeongju-si, [48] Hyeongok-myeon, Geumjang-ri, Bridge Geumjang • Gyeongsan-si: [50] Yeongnam University; [49] Department of Biology.

**Chungcheongnam-do** • Yesan-gun, [51] Deoksan-myeon, Sudeoksa Temple • Gongju-si, [52] Banpo-myeon, Hakbong-ri • Geumsan-gun: [53] Chubu-myeon, Seongdang-ri, Gaedeoksa Temple; [54] Nami-myeon, Boseok Temple.





**Figure 1.** Collecting localities of the material on the listed species. Point numbers correspond with numbers in brackets in text.

**Chungcheongbuk-do** • Jecheon-si, [55] Geumseong-myeon, Seongnae-ri • Chungju-si, [56] Sancheok-myeon, Yeongdeok-ri • Jincheon-gun, [57] Jincheon-eup, Saseong-ri • Goesan-gun, [58] Chilseong-myeon, Ssangnok-ri; Cheongcheon-myeon: [59] Sagimak-ri; [60] Sagimak-ri, Mindung Mountain; [61] Cheongcheon-ri • Okcheon-gun, [62] Iwon-myeon, Iwon-ri.

**Jeollabuk-do** • Jinan-gun, [63] Jinan-eup, Danyang-ri, Maisan Mountain.

**Gyeongsangnam-do** • Goseong-gun: [64] Sangni-myeon, Bupo-ri; [65] Geochang-eup, Songjeong-ri • Hamyang-gun, [66] Macheon-myeon • Uiryeong-gun, [67] Garye-myeon, Gapeul-ri, Jagulsan Mountain • Changwon-si, [68] Masanhappo-gu, Jinbuk-myeon, Yeonghak-ri, Seobuk Mountain • Jinju-si: [69] Daepyeong-myeon: [70] Daepyeong-ri; [71] Naechon-ri; [72] Gajwa-dong; [73] Jinseong-myeon, Daesa-ri; Naedong-myeon: [74] Naepyeong-ri; [75] Doksan-ri (around the forest



road); [76] Geumgok-myeon • Sacheon-si, [77] Baekcheon-dong, Waryongsan Mountain • Tongyeong-si, [78] Hansan-myeon, Bijin Island, Bijin-ri • Namhae-gun, [79] Idong-myeon, Sinjeon-ri, Geumsan Mountain.

**Jeollanam-do** • Jangseong-gun, [80] Samgye-myeon, Singi-ri, Taecheongsan Mountain, Bongjeongsa Temple • Gurye-gun: [81] Sandong-myeon, Jwasa-ri, Jirisan Mountain (Simwon); [82] Toji-myeon, Oegok-ri, Jirisan Mountain (Piagol) • Sinan-gun, [83] Heuksan-myeon, Heuksando Island • Yeosu-si, Nam-myeon: [84], Dumo-ri, Town Moha; [85] Yuseong-ri, Geumodo Island, Daedaesan Mountain; [86] Geumodo Island, Uhak-ri; [87] Ando Island, Ando-ri; [88] Yeondo Island, Yeondo-ri.

**Jeju-do** • Jeju-si, [89] Odeung-dong, Hanlla Mountain • Seogwipo-si, [90] Andeok-myeon, Sanbangsan Mountain.

The distribution map is generated in R using the packages *sf*, *ggplot2* and *shadow-text* based on the data from the Database of Global Administrative Areas (gadm.org). Distribution by countries is listed mainly according to Yu et al. (2016), other references are indicated in the text.

## Material of related species used in diagnoses of taxa and illustrations

### *Bracon (Osculobracon) subcingillus* Tobias, 2000

**Type material. *Holotype*.** RUSSIA – **Primorskiy Territory** • female; Partizansky District, 15 km NW of Partizansk; 13 Jul. 1979; S.A. Belokobylskij leg.; forest; ZISP.

### *Iphiaulax impeditor* (Kokujev, 1898)

**Type material. *Lectotype*.** UZBEKISTAN/TAJIKISTAN • female; “from Yavan to Guzar”; 28 May 1888; A.P. Semenov leg.; ZISP.

**Other material.** RUSSIA – **Saratov Province** • 1 female; Krasnokutsky District, Dyakovka, Yeruslan River bank; 26 Jun. 2012; D.M. Astakhov leg.; ZISP B0081 • 1 female; Krasnokutsky District, 5 km W of Dyakovka; 27 Jun. 2012; K. Samartsev leg.; burnt area; ZISP B0082.

## Results

### Genus *Atanycolus* Foerster, 1862

#### *Atanycolus ivanowi* (Kokujev, 1898)

Figs 2–5, A1

**Material.** SOUTH KOREA (1 female, 1 male). – **Gangwon-do** • 1 female; Yanggu-gun, [8] Bangsan-myeon, Omi-ri; 13 Jun. 1992; D.-S. Ku leg.; NIBR 510 • 1 male; same data as for preceding; SMNE 511.



**Additional material.** ?ITALY • 1 male (lectotype of *Bracon sculpturatus* Thomson, 1892); ZMLU • 1 female (paralectotype of *B. sculpturatus* Thomson); ZMLU.

ROMANIA • 1 female (lectotype of *Atanycolus signatus* Szépligeti, 1901); Transylvania, Domogled Mountains; 15–27 Jun. 1876; A. Moczary leg.; HNHM 153261.

RUSSIA – **Orenburg Province** • 1 female; Saraktashskiy District, Saraktashskiy forestry, quarter 33; 16 Jul. 2007; T.S. Kostromina and V.A. Kozlov leg.; on fallen poplars; ZISP B0094.

SLOVAKIA • 1 female (paralectotype of *A. signatus* Szépligeti); Zádiel; HNHM 153262.

UKRAINE • 1 female (lectotype of *Vipio ivanowi* Kokujev, 1898); vicinity of Kharkiv, Vodyanoye; 26 Jun. 1886; I.Ya. Shevyrev leg.; ZISP.

TURKMENISTAN – **Ahal Region** • 1 female; “sovkhoz Sovet Azerbaydzhany”; 1 Oct. 1988; Pashaev leg.; apricot; from “*Sph. kam.* and *chr.*” [*Sphenoptera* spp.]; ZISP B0095.

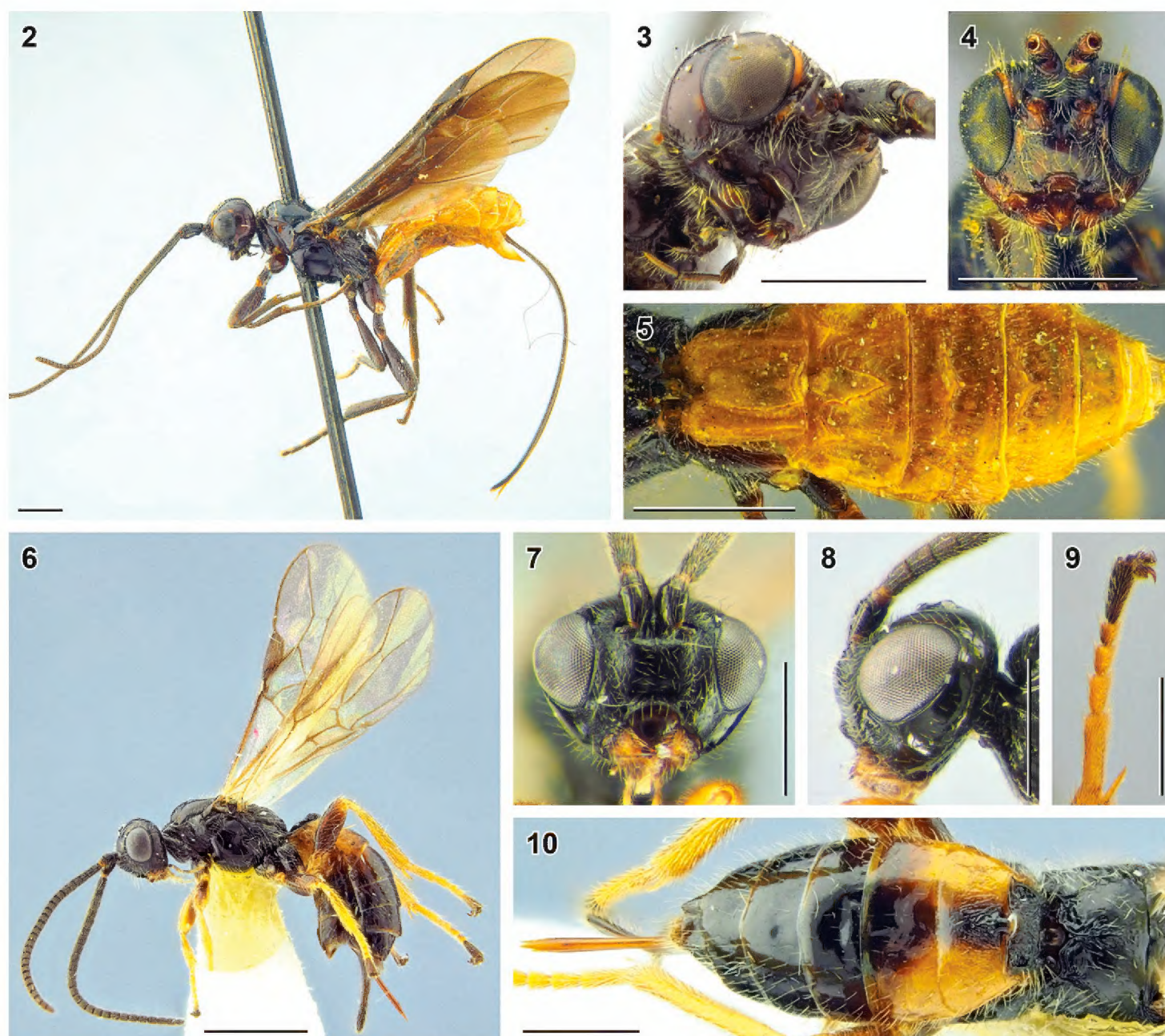
**Distribution.** Caucasus: Armenia, Azerbaijan. Central Asia: Tajikistan, Turkmenistan, Uzbekistan. China: Xinjiang (Li et al. 2020a). Europe: Eastern, Southern, and Western Europe. Iran. Japan: Hokkaido. Kazakhstan. Russia: Eastern Siberia, European part, Far East: Jewish Autonomous Province, Primorskiy Territory, Sakhalin Island; Ural (Kostromina 2010). South Korea (new record). Turkey.

**Diagnosis.** The species is easily recognisable by the following character states: the median area of third metasomal tergite strongly elevated and transverse, with rounded sides and strongly narrowed posteriorly (Fig. 5); third and fourth tergites longitudinally rugose, their apical margins with incomplete, weak and weakly crenulate transverse subapical grooves. See also Li et al. (2020a: 15) for taxonomic literature and additional illustrations.

## Genus *Bracon* Fabricius, 1804

**Remarks.** The subgeneric classification of the genus requires revision. Most of the Palearctic species of *Bracon* are arranged in three subgenera, *Bracon* s. str., *Glabrobracon* Fahringer, and *Lucobracon* Fahringer (Tobias 1986). The species that may be unambiguously attributed to one of the discussed subgenera are more common in the West Palearctic, but classification of a big part of species is difficult, because they frequently combine diagnostic characters of different subgenera. For example, some of otherwise obvious members of *Glabrobracon* have the wide hypostomal depression (one of the main characters of the subgenus *Lucobracon*, e.g. *B. brevis* Telenga and *B. otiosus* Marshall), others have the enlarged basitarsi (characterising the section *Orthobracon* Fahringer of the subgenus *Bracon*; e.g. *B. pauris* Beyarslan and *B. rozneri* Papp). This ambiguity of subgeneric diagnoses caused instability of composition of the main subgenera in interpretation by different authors. For example, the type species of the genus, *B. minutator* (Fabricius), in violation of the Principle of Coordination has been placed in the section *Orthobracon* of the subgenus *Bracon* by Tobias (1986) and together with the most part of the latter section has been transferred to the subgenus *Glabrobracon* by Papp (2008). These problems are most noticeable in the Far Eastern species which morphological peculiarity has rendered the diagnoses of





**Figures 2–10.** *Atanycolus ivanowi* (Kokujev, 1898) (**2, 3** lectotype, female, ZISP **4, 5** paralectotype of *A. signatus* Szépligeti, 1901, female, HNHM) and *Bracon (Bracon) albion albion* Papp, 1999 (**6–10** paratype, female, HNHM) **2, 6** habitus, lateral view **3** head, ventrolateral view **4, 7** head, anterior view **5, 10** metasoma, dorsal view **8** head, lateral view **9** hind tarsus. Scale bars: 0.5 mm (**7–10**); 1 mm (**2–6**).

the main subgenera very diffused and almost inapplicable (Tobias and Belokobylskij 2000). Thus, until reliable criteria of the subgeneric division of *Bracon* are established, we consider the species of *Glabrobracon* and *Lucobracon* in the nominative subgenus.

***Bracon (Bracon) albion albion* Papp, 1999**

Figs 6–10

*Bracon (Glabrobracon) albion* Papp, 1999: 146.

**Material examined.** UNITED KINGDOM – **Scotland** • 4 females (paratypes); Dunbartonshire, Caldarvan; 27 Jun. 1983–7 Jul. 1983; I.C. Christie leg.; bog with *Betula* and *Myrica*, Malaise trap; HNHM 153307–153310 • 4 males (paratypes); same data as for preceding;



HNHM 153316–153319 • 2 females (paratypes); Dunbartonshire, Caldervan; 7–18 Jul. 1983; I.C. Christie leg.; bog with *Betula* and *Myrica*, Malaise trap; HNHM 153311, 153312 • 2 males (paratypes); same data as for preceding; HNHM 153320, 153321 • 1 female (paratype); same data as for preceding; 19 Jul. – 18 Aug. 1983; 153313; HNHM • 1 female (paratype); Perthshire, vicinity of Crianlarich, Coire Choille Chuilc; Jul. 1985; I. MacGowan and R.M. Lyszkowski leg.; pine forest; HNHM 153314.

**Distribution.** Europe: United Kingdom.

**Diagnosis.** The species belongs to the section *Orthobracon* Fahringer sec. Tobias (1986) of the subgenus *Bracon* and may be compared with *B. exhilarator* Nees, 1834, *B. longigenis* Tobias, 1957, *B. munki* Papp, 2011, *B. pertinax* Papp, 1984, and *B. terebralis* Tobias, 2000. *B. albion* differs from all above mentioned species by a combination of strongly enlarged fifth tarsal segment (Fig. 9) and thickened antenna (especially in Europe; Fig. 6).

**Remarks.** A single female paratype of *B. albion albion* Papp from Denmark belongs to *B. albion continentalis* ssp. nov. Thus, the nominative subspecies is considered to be endemic of the British Isles.

***Bracon (Bracon) albion continentalis* ssp. nov.**

<http://zoobank.org/7133D622-79D7-46C2-BF09-1589BCB23B05>

Figs 11–21, A1

**Type material. Holotype.** SOUTH KOREA – **Gyeongsangbuk-do** • female; Seongju-gun, [47] Suryun-myeon, Bongyang-ri; 9 Jun. 1992; D.-S. Ku leg.; NIBR 344.

**Paratypes.** (2 females). SOUTH KOREA – **Chungcheongbuk-do** • 1 female; Jecheon-si, [55] Geumseong-myeon, Seongnae-ri; 10 Jun. 1992; D.-S. Ku leg.; SMNE 331. – **Gyeongsangnam-do** • 1 female; Geochang-gun, [65] Geochang-eup, Songjeong-ri; 35.6712, 127.8850; 3 Jun. 2019; K. Samartsev leg.; forest on a mountain, sweeping; ZISP B0058.

**Additional material.** DENMARK • 1 female (paratype of *B. albion albion* Papp, 1999); Jutland, NE of Ribe, Haslund Krat; 13 Jul. 1987; T. Munk leg.; HNHM 153315.

RUSSIA – **Novgorod Province** • 1 female; Pestovskiy District, 20 km NW of Pestovo, Tychkino; 6 Jul. 1986; V.I. Tobias leg.; ZISP • 2 females; same data as for preceding; 29 Jul. 1990; ZISP B0078, B0079.

**Etymology.** The name *continentalis* is formed from Latin noun *continens* indicating the wide distribution of the subspecies across the continental part of Palaearctic in contrast with the island distribution of the nominative subspecies.

**Description. Female.** Body length 3.5–3.8 mm (Russian non-type specimens: 2.8–3.2 mm); fore wing length 3.2–3.6 mm (2.9–3.2 mm).

**Head.** Width of head (dorsal view) 1.6–1.8× (1.8–1.9×) its median length. Transverse diameter of eye (dorsal view) 1.8–1.9× (1.9–2.0×) longer than temple. Eyes with sparse, short setae. OOL 2.4–2.6× (2.2×) Od; POL 1.1–1.2× (1.2–1.4×) Od; OOL





**Figures 11–21.** *Bracon (Bracon) albion continentalis* ssp. nov. (holotype, female, NIBR) **11** habitus, lateral view **12** wings **13** head and mesoscutum, dorsal view **14** head, ventrolateral view **15** head, anterior view **16** head, lateral view **17** mesosoma, lateral view **18** propodeum, dorsal view **19** metasoma, dorsal view **20** hind tarsus and ovipositor **21** first metasomal tergite, dorsal view. Scale bars: 0.5 mm (**13–21**); 1 mm (**11, 12**).



2.0–2.3× (1.6–1.7×) POL. Frons with deep medio-longitudinal groove. Longitudinal diameter of eye (lateral view) 1.4–1.5× its transverse diameter. Transverse diameter of eye (lateral view) 2.0–2.2× (2.3–2.4×) longer than minimum width of temple, hind margins of eye and temple subparallel to broadened downwards. Face width 1.7–1.9× combined height of face and clypeus; 2.2–2.3× width of hypoclypeal depression. Longitudinal diameter of eye 2.4–2.7× (2.3–2.4×) longer than malar space (anterior view); malar space 0.75–0.90× basal width of mandible. Malar suture absent. Width of hypoclypeal depression 1.3× distance from depression to eye. Clypeus prominent, its height about 0.33× (0.25×) width of hypoclypeal depression. Maxillary palp longer than eye, but shorter than head.

**Antenna** 0.75–0.90× as long as fore wing, with 29 antennomeres. First, middle, and penultimate flagellomeres 1.4–1.7× (1.5–1.8×), 1.3–1.5× (1.2–1.3×), and 1.5–1.7× longer than wide, respectively.

**Mesosoma** 1.6× (1.6–1.7×) longer than its maximum height. Transverse pronotal sulcus deep, smooth or weakly crenulate. Notauli impressed anteriorly, shallow and not united posteriorly. Mesoscutum with setae only on notaulic area. Scutellar sulcus crenulate. Mesepimeral sulcus smooth (weakly crenulate), mesopleural pit deep, separated from mesepimeral sulcus. Metapleural sulcus smooth or weakly crenulate (crenulate). Propodeal spiracle round, located in middle of propodeum. Propodeum with branching medio-longitudinal keel in apical half (complete).

**Wings.** Fore wing 0.92–0.95× as long as body. Pterostigma 2.8–3.3× longer than wide. Vein r arising from basal 0.50–0.55× (0.45–0.50×) of pterostigma. Vein 1-R1 1.4–1.5× (1.6–1.7×) longer than pterostigma. Marginal cell 8–10× longer than distance from its apex to apex of wing. Vein 3-SR 2.1–2.7× vein r, 0.55–0.65× vein SR1, 1.2–1.5× vein 2-SR. Vein 1-M 0.67–0.70× vein 1-SR+M, 1.5–1.8× vein m-cu, 2.0–2.2× vein cu-a. Vein 2-SR+M 0.10–0.25× vein 2-SR, 0.2–0.4× vein m-cu. Vein 1-CU1 (posterior margin of discal cell) 2.4–2.7× (2.7–3.6×) vein cu-a. Vein cu-a antefurcal or interstitial. Vein 2-1A of hind wing absent or very short.

**Legs.** Fore tibia with longitudinal and transverse apical rows of thick setae. Hind femur 2.4–2.5× longer than wide. Hind tibia 1.5–1.6× longer than hind femur, without subapical row of thick setae, its inner spur about 0.6× (0.65–0.75×) as long as hind basitarsus. Hind tarsus 0.85–0.90× as long as hind tibia. Fifth segment (without pretarsus) of hind tarsus 1.9–2.1× (1.8–1.9×) longer than second segment and 1.2–1.3× longer than hind basitarsus. Claws with rectangular (acute angularly protruding) basal lobe.

**Metasoma** 1.2–1.5× longer than mesosoma. First metasomal tergite with more or less developed dorsolateral carinae composed of multiple rugae and with lateral carinae, its median length 0.80–0.85× its apical width; median area separated by rugate furrow. Second tergite with weak, very short, and narrow triangular median area and weakly impressed dorsolateral impressions, medially 0.75–0.95× as long as third tergite and 0.70–0.75× (0.75–0.85×) as large as apical width of first tergite. Basal width of second metasomal tergite 1.8–2.1× (1.6–1.7×) its median length. Suture between second and third tergites weak laterally, medially deep, weakly curved and crenulate. Apical margins of third to sixth tergites thin, without transverse subapical grooves.



Ovipositor sheath  $0.75\text{--}0.85\times$  as long as hind tibia and  $0.20\text{--}0.25\times$  as long as fore wing. Apex of ovipositor with weak nodus and developed ventral serration.

**Sculpture.** Face (almost) smooth (weakly granulate); malar space granulate; frons weakly granulate. Mesosoma mostly smooth; metanotum smooth with rugae on margins; propodeum smooth (granulate-rugulose posteriorly) with tree-like rugosity in apical half. First tergite laterally rugulose, its median area posteriorly obliquely rugulose to rugose; second metasomal tergite longitudinally rugose medially, laterally granulate-rugulose; third and posterior tergites (almost) smooth.

**Colour.** Body mostly black; legs rusty brown, coxae black, middle and hind femora basally dark brown, or all legs entirely, except for brownish coxae and tarsi, brownish yellow; ventral side of metasoma anteriorly yellowish brown, or metasoma mostly brownish yellow, medio-longitudinally brown; maxillary palps brownish yellow or pale yellow; wing membrane weakly brownish darkened, pterostigma and wing veins brown.

**Male.** Unknown.

**Distribution.** Europe: Northern Europe (Denmark: Papp 1999, as *B. albion*). South Korea. Russia: European part: Novgorod Province, Saratov Province (Samartsev 2013, as *B. albion*).

**Diagnosis.** The new subspecies differs from *B. albion albion* Papp by the extremely short basitarsus and enlarged fifth segment of the hind leg (Fig. 20). In addition, the Korean specimens of *B. albion continentalis* ssp. nov. have less thickened antennae (Fig. 11), more coarsely (with distinct longitudinal rugae) sculptured second metasomal tergite (Fig. 19), and almost smooth face (Fig. 14; weakly granulate in the European specimens).

### *Bracon (Bracon) imbricatellus* Tobias, 2000

Figs 22–28, A1

**Material.** SOUTH KOREA (4 females). – **Gyeonggi-do** • 1 female; Suwon-si, [36] Janggan-gu, Pajang-dong, Gwanggyosan Mountain; 22 Jul. 1998; D.-S. Ku leg.; light trap; SMNE 943 • 1 female; Suwon-si, [37] Gwonseon-gu, Seodun-dong, Yeogisan Mountain; 31 Jul. 1995; June-Yeol Choi leg.; Malaise trap; SMNE 944 • 1 female; same data as for preceding; 14 Aug. 1995; ZISP 937 • 1 female; same data as for preceding; NIBR 938.

**Additional material.** JAPAN – **Fukushima Prefecture** • 1 female (holotype); Hi-noemata; 16–18 Aug. 1999; S.A. Belokobylskij leg.; ZISP.

**Distribution.** Japan: Honshu. South Korea (new record).

**Description. Female.** Fore wing length 2.6–3.0 mm. Width of head (dorsal view)  $1.7\text{--}1.8\times$  its median length. Transverse diameter of eye (dorsal view)  $1.6\text{--}2.0\times$  longer than temple. OOL  $2.0\text{--}2.8\times$  Od; POL  $1.2\text{--}1.8\times$  Od; OOL  $1.6\text{--}1.7\times$  POL. Longitudinal diameter of eye (lateral view)  $1.3\text{--}1.6\times$  its transverse diameter; hind margins of eye and temple subparallel. Face width  $1.4\text{--}1.5\times$  combined height of face and clypeus. Longitudinal diameter of eye  $3.1\text{--}3.3\times$  longer than malar space (anterior view). Malar suture weak under eye, smoothed near mandible. Width of hypoclypeal depression



1.2–1.4× distance from depression to eye. Antenna 0.90–0.95× as long as fore wing, with 24–25 antennomeres. First, middle and penultimate flagellomeres 2.0–2.1×, 1.7–2.0, and 1.8–2.2× longer than wide, respectively. Mesosoma 1.7–1.8× longer than its maximum height. Mesoscutum evenly, but sparsely setose. Notauli deep anteriorly, shallow and not united posteriorly. Mesepimeral and metapleural sulci smooth. Medio-longitudinal keel developed in apical third of propodeum, branching. Fore wing vein  $r$  arising from basal 0.40–0.45 of pterostigma; vein 1-R1 1.5–1.7× longer than pterostigma; marginal cell 12–16× longer than distance from its apex to apex of wing; vein 3-SR 2.0–2.5× vein  $r$ , 0.55–0.65× vein SR1, 1.3–1.4× vein 2-SR. Hind femur 3.0–3.4× longer than wide. Hind tibia without subapical row of thick setae. Fifth segment of hind tarsus 0.50–0.55× and 0.95–1.00× as long as hind basitarsus and second segment, respectively. Claws with acute angularly protruding basal lobe. First metasomal tergite with incomplete dorsal carina and developed dorsolateral carinae, its median length 0.70–0.85× its apical width. Second tergite with weak, narrow, longitudinal median area, weak anterolateral areas with smooth sculpture, and with deep s-shaped crenulate dorsolateral impressions bordered by long carinae; medially 1.1–1.5× longer than third tergite; its basal width 1.3–1.8× its median length. Second metasomal suture deep, curved and crenulate. Apical margins of third–sixth tergites thick, with weakly foveate transverse subapical grooves. Ovipositor sheath 0.85–1.00× as long as hind tibia and 0.23–0.25× as long as fore wing. Apex of ovipositor with weak nodus and ventral serration. Body mainly smooth; face medially and malar space granulate, face laterally and frons weakly granulate; propodeum posteriorly hardly coriaceous, with tree-like rugosity medially in posterior half; first metasomal tergite smooth to weakly foveate; second tergite areolate-rugose to foveate; third–sixth tergites smoothed foveate, or metasoma entirely areolate-rugose to foveate-rugose. Head and mesosoma mostly reddish brown with yellowish brown pattern, legs and lateral and ventral parts of metasoma reddish yellow; antenna basally reddish yellow, flagellum darkening apically; maxillary palps yellow; tegulae brownish yellow; propodeum and most of metasoma dorsally dark brown; wing membrane weakly darkened, pterostigma and veins brown.

**Remarks.** Relationships of the species are given below, in the diagnosis of *B. virgatus* Marshall.

### *Bracon (Bracon) kasparyani* Samartsev, 2018

Fig. A2

**Material.** SOUTH KOREA (23 females, 7 males). – **Gangwon-do** • 2 females; Go-seong-gun, [3] Geojin-eup, Naengcheon-ri, Geonbongsa Temple; 25 May 1993; D.-S. Ku leg.; SMNE 572, 573 • 1 female; Donghae-si, [15] Bukpyeong-dong; 28 May 1993; D.-S. Ku leg.; NIBR 582 • 1 male; Yeongwol-gun, [17] Nam-myeon; 24 May 1993; D.-S. Ku leg.; SMNE 577 • 2 females; Yeongwol-gun, [18] Hanbando-myeon, Ssangyong-ri; 24 May 1993; D.-S. Ku leg.; SMNE 578, 579 • 1 female; Taebaek-si, [20] Cheoram-dong, Geumganggol; 8 Jul. 1991; D.-S. Ku leg.; SMNE 592 • 1 female;



Taebaek-si, [21] Cheoram-dong; 22 Jun. 1991; D.-S. Ku leg.; SMNE 575 • 1 male; same data as for preceding; 6 Jul. 1991; SMNE 593. – **Gyeonggi-do** • 1 female; Pocheon-si, [26] Hwahyeon-myeon, Hwahyeon-ri, Unaksan Mountain; 14 Jun. 1992; D.-S. Ku leg.; SMNE 596 • 1 female; Suwon-si, [37] Gwonseon-gu, Seodun-dong, Yeogisan Mountain; 19–26 May 1994; D.-S. Ku leg.; Malaise trap; SMNE 590. – **Gyeongsangbuk-do** • 2 females; Bonghwa-gun, [40] Seokpo-myeon, Seokpo-ri; 28 May 1993; D.-S. Ku leg.; SMNE 580, 581 • 1 male; same data as for preceding; SMNE 583 • 1 female; Gimcheon-si, [44] Eomo-myeon, Gurye-ri; 9 Jun. 1992; D.-S. Ku leg.; SMNE 589 • 2 males; Yeongcheon-si, [46] Hwabuk-myeon, Sangsong-ri, Nogwijae ridge; 29 May 1993; D.-S. Ku leg.; SMNE 586, 587. – **Chungcheongnam-do** • 1 female; Geumsan-gun, [53] Chubu-myeon, Seongdang-ri, Gaedeoksa Temple; 22 May 1993; D.-S. Ku leg.; ZISP 574. – **Chungcheongbuk-do** • 1 female; Jincheon-gun, [57] Jincheon-eup, Saseong-ri; 15 Jun. 1992; D.-S. Ku leg.; SMNE 600 • 1 male; same data as for preceding; SMNE 601 • 1 female; Goesan-gun, [58] Chilseong-myeon, Ssangnok-ri; 23 May 1993; D.-S. Ku leg.; SMNE 594 • 1 female; Goesan-gun, [59] Cheongcheon-myeon, Sagimak-ri; 23 May 1993; D.-S. Ku leg.; SMNE 576. – **Jeollabuk-do** • 1 female; Jinan-gun, [63] Jinan-eup, Danyang-ri, Maisan Mountain; 16 Jun. 1996; D.-S. Ku leg.; SMNE 599. – **Gyeongsangnam-do** • 1 female; Jinju-si, [69] Daepyeong-myeon; 12 Jun. 1992; D.-S. Ku leg.; SMNE 591 • 1 male; Jinju-si, [70] Daepyeong-myeon, Daepyeong-ri; 23 Jun. 1992; D.-S. Ku leg.; SMNE 597 • 1 female; Jinju-si, [72] Gajwa-dong; 9 Jun. 1993; D.-S. Ku leg.; ZISP 588 • 2 females; same data as for preceding; 14 Jul. 1993; SMNE 584, 585 • 1 female; Sacheon-si, [77] Baekcheon-dong, Waryongsan Mountain; 5 Jun. 1993; J.-S. Cheon leg.; ZISP 595. – **Jeollanam-do** • 1 female; Gurye-gun, [81] Sandong-myeon, Jwasa-ri, Jirisan Mountain (Simwon); 30–31 Jun. 1992; D.-S. Ku leg.; light trap; SMNE 598.

**Distribution.** Japan: Hokkaido (Samartsev 2018). Russia: Far East (Samartsev 2018): Amur Province, Kuril Islands, Primorskiy Territory, Sakhalin Island. South Korea (new record).

**Remarks.** The diagnosis of the species is presented in Samartsev (2018) and Samartsev and Ku (2020).

### *Bracon (Bracon) kotenkoi* Samartsev, 2018

Fig. A3

**Material.** SOUTH KOREA (2 females). – **Jeollanam-do** • 1 female; Sinan-gun, [83] Heuksan-myeon, Heuksando Island; 26 Aug. 1993; D.-S. Ku leg.; NIBR 404 • 1 female; Yeosu-si, [88] Nam-myeon, Yeondo Island, Yeondo-ri; 5 Aug. 1993; D.-S. Ku leg.; SMNE 405.

**Distribution.** Russia: Far East: Primorskiy Territory (Samartsev 2018). South Korea (new record).

**Remarks.** The diagnosis of the species is presented in Samartsev (2018) and Samartsev and Ku (2020).



***Bracon (Bracon) longigenis* Tobias, 1957**

Figs 29–36, A3

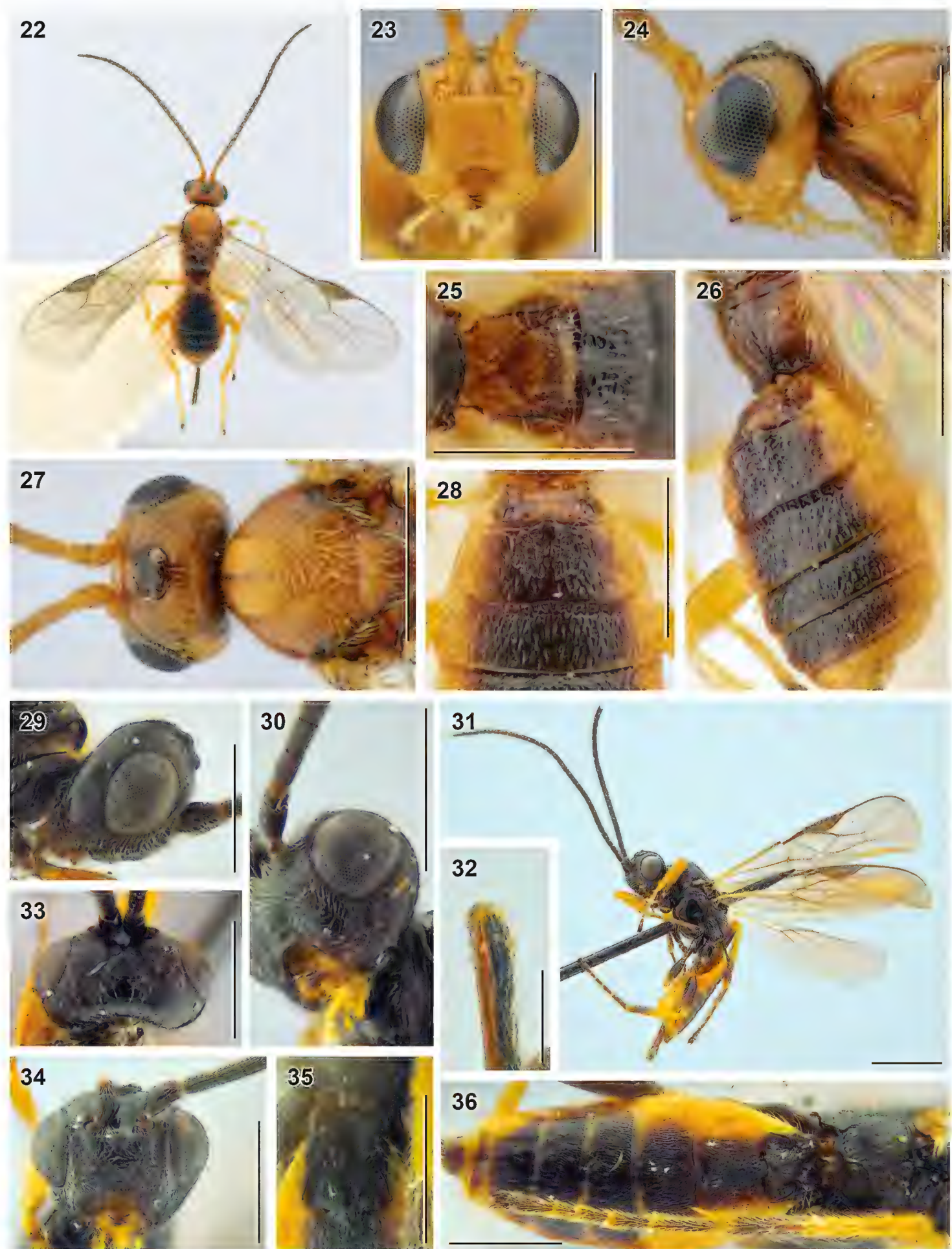
**Material.** SOUTH KOREA (4 females). – **Gyeongsangbuk-do** • 1 female; Gyeongsan-si, [50] Yeongnam University; 4 May 1988; D.-S. Ku leg.; SMNE 676. – **Chungcheongnam-do** • 1 female; Geumsan-gun, [53] Chubu-myeon, Seongdang-ri, Gaedeoksa Temple; 22 May 1993; D.-S. Ku leg.; NIBR 673 • 1 female; same data as for preceding; SMNE 674 • 1 female; same data as for preceding; ZISP 675.

**Additional material.** RUSSIA – **Crimea Republic** • female (holotype); Simferopol; 17 May 1927; V. and E. Kusnetzovs leg.; ZISP • 1 female (paratype); same data as for holotype; ZISP. – **Saratov Province** • 1 female; Krasnoarmeysky District, 4 km NW of Melovoye; 29 May 2011; K. Samartsev leg.; sparse oak forest; ZISP B0088.

**Distribution.** Israel. Russia: European part. South Korea (new record). Turkey.

**Description. Female.** Fore wing length 2.9–3.2 mm. Width of head (dorsal view) 1.8–1.9× its median length. Transverse diameter of eye (dorsal view) 1.8–2.0× longer than temple. OOL 1.9–2.9× Od; POL 1.3–1.7× Od; OOL 1.3–2.1× POL. Longitudinal diameter of eye (lateral view) 1.3× its transverse diameter; hind margins of eye and temple subparallel. Face width 1.4–1.7× combined height of face and clypeus. Longitudinal diameter of eye 1.7–1.8× longer than malar space (anterior view). Malar suture absent. Width of hypoclypeal depression 0.85–0.97× distance from depression to eye. Antenna 1.0–1.2× as long as fore wing, with 30–33 antennomeres. First, middle and penultimate flagellomeres 1.7–2.0×, 1.3–1.6×, and 1.8–2.0× longer than wide, respectively. Mesosoma 1.7× longer than its maximum height. Mesoscutum setose only on notaulic area. Notauli impressed anteriorly, shallow and not united posteriorly. Mesepimeral sulcus weakly crenulate; metapleural sulcus crenulate. Medio-longitudinal keel on propodeum complete, branching. Fore wing vein r arising before middle of pterostigma; vein 1-R1 1.5–1.6× longer than pterostigma; marginal cell 10–15× longer than distance from its apex to apex of wing; vein 3-SR 2.0–2.4× vein r, 0.55–0.65× vein SR1, 1.3–1.5× vein 2-SR. Hind femur 2.8–3.5× longer than wide. Hind tibia with subapical transverse row of spiny setae. Fifth segment of hind tarsus 0.6–0.9× and 1.1–1.5× as long as hind basitarsus and second segment, respectively (see also a remark below). Claws with large rectangular basal lobe. First metasomal tergite with complete dorsal carinae and developed dorsolateral carinae, its median length 0.85–0.95× its apical width. Second tergite with indistinct median area and with shallow dorsolateral impressions, medially 0.9–1.0× as long as third tergite; its basal width 1.4–1.8× its median length. Second metasomal suture deep, strongly curved and crenulate. Apical margins of third to sixth tergites thin. Ovipositor sheath 0.70–0.85× as long as hind tibia and 0.20–0.25× as long as fore wing. Apex of ovipositor with weak nodus and distinct ventral serration. Body mostly smooth; face weakly granulate; frons and malar space granulate; propodeum medioposteriorly granulate-rugulose; median area of first tergite posteriorly rugose; second tergite rugose to granulate-rugulose, third–fifth tergites granulate to weakly granulate, sixth tergite almost smooth. Head and





**Figures 22–36.** *Bracon (Bracon) imbricatellus* Tobias, 2000 (22–28 holotype, female, ZISP) and *B. (B.) longigenis* Tobias, 1957 (29, 31, 32, 35, 36 holotype 30, 34 paratype, female, ZISP) 22 habitus, dorsal view 23, 34 head, anterior view 24, 29 head, lateral view 25, 35 first metasomal tergite, dorsal view 26 metasoma, dorsolateral view 27, 33 head (and mesoscutum), dorsal view 28 metasoma, dorsal view 30 head, ventrolateral view 31 habitus, lateral view 32 apex of ovipositor 36 metasoma and hind tarsus, dorsal view. Scale bars: 0.25 mm (32); 0.5 mm (23–30, 34–36); 1 mm (31).



mesosoma brownish black, metasoma medio-longitudinally dark brown; lateral parts of metasomal tergites and ventral side of metasoma reddish yellow; legs mostly reddish yellow or middle and hind legs with developed dark brown pattern; maxillary palps yellow; tegulae yellowish brown; wing membrane weakly darkened, pterostigma and veins brown or yellowish brown.

**Diagnosis.** Within the section *Orthobracon* Fahringer sec. Tobias (1986), *B. longigenis* is remarkable by the very long malar space (Figs 30, 33), entirely sculptured metasoma with elongate first tergite (Figs 35, 36), and dark-coloured body.

**Remarks.** The specimens from South Korea have the apical tarsomere 1.4–1.5× longer than the second tarsal segment (while in *B. longigenis* from Europe this ratio is 1.15–1.25) and entirely light-coloured legs (except the brownish hind tarsus; middle and hind legs extensively darkened in *B. longigenis* from Europe).

### ***Bracon (Bracon) santachezae* Samartsev, 2018**

Fig. A3

**Material.** SOUTH KOREA (1 female, 1 male). – **Gyeonggi-do** • 1 female; Paju-si, [27] Gunnae-myeon, Jeomwon-ri; 3 Jun. 1998; Heung-Sik Lee leg.; NIBR 401 • 1 male; Paju-si, [28] Munsan-eup, Majeong-ri, Freedom Bridge (pond); 3 Jun. 1998; Heung-Sik Lee leg.; SMNE 403.

**Distribution.** Russia: Far East: Primorskiy Territory (Samartsev 2018). South Korea (new record).

**Remarks.** The diagnosis of the species is presented in Samartsev (2018).

### ***Bracon (Bracon) semitergalis* Tobias, 2000**

Figs 37–45, A4

*Bracon semitergalis* Tobias, 2000 in Belokobylskij and Tobias 2000: 126.

*Bracon leptotes* Li, He & Chen, 2020b: 222; syn. nov.

**Material.** SOUTH KOREA (9 females, 4 males). – **Gangwon-do** • 1 female; Goseong-gun, [5] Toseong-myeon, Sinpyeong-ri, Seoraksan Mountain; 2 Aug. – 19 Oct. 2002; D.-S. Ku leg.; Malaise trap; SMNE 767 • 1 female; Gapyeong-gun, [32] Cheongpyeong-myeon, Homyeong-ri, Cheongpyeong Dam; 14 Jun. 1992; D.-S. Ku leg.; NIBR 1441 • 1 female; Yangpyeong-gun, [34] Okcheon-myeon, Yongcheon-ri, Yongmunsan Mountain; 14 Jun. 1992; D.-S. Ku leg.; SMNE 1489 • 1 male; Suwon-si, [37] Gwonseon-gu, Seodun-dong, Yeogisan Mountain; 11 May 1994; D.-S. Ku leg.; SMNE 763. – **Gyeongsangbuk-do** • 1 male; Bonghwa-gun, [40] Seokpo-myeon, Seokpo-ri; 28 May 1993; D.-S. Ku leg.; SMNE 765. – **Chungcheongbuk-do** • 1 male; Chungju-si, [56] Sancheok-myeon, Yeongdeok-ri; 23 May 1993; D.-S. Ku leg.; SMNE 755 • 1 female; Jincheon-gun, [57] Jincheon-eup, Saseong-ri; 15 Jun.



1992; D.-S. Ku leg.; SMNE 768 • 1 female; Goesan-gun, [61] Cheongcheon-myeon, Cheongcheon-ri; 23 May 1993; D.-S. Ku leg.; SMNE 754 • 1 male; Okcheon-gun, [62] Iwon-myeon, Iwon-ri; 22 May 1993; D.-S. Ku leg.; SMNE 762. – **Gyeongsangnam-do** • 1 female; Jinju-si, [72] Gajwa-dong; 15 May 1993; D.-S. Ku leg.; ZISP 764. – **Jeollanam-do** • 1 female; Gurye-gun, [81] Sandong-myeon, Jwasa-ri, Jirisan Mountain (Simwon); 4 Aug. 1996; K.-J. Hong leg.; SMNE 766 • 1 female; Yeosu-si, [88] Nam-myeon, Yeondo Island, Yeondo-ri; 20 Jul. 1993; D.-S. Ku leg.; SMNE 760 • 1 female; same data as for preceding; ZISP 761.

**Additional material.** RUSSIA – **Primorskiy Territory** • 1 female (holotype); Shkotovskiy District, Anisimovka; 5–7 Jun. 1993; S.A. Belokobylskij leg.; forest, meadow; ZISP.

**Distribution.** Russia: Far East: Primorskiy Territory; South Korea (new record).

**Description. Female.** Fore wing length 2.7–3.4 mm. Width of head (dorsal view)  $1.7\times$  its median length. Transverse diameter of eye (dorsal view)  $2.3\text{--}2.5\times$  longer than temple. OOL  $2.6\text{--}2.8\times$  Od; POL  $1.3\text{--}1.5\times$  Od; OOL  $1.8\text{--}2.2\times$  POL. Longitudinal diameter of eye (lateral view)  $1.3\text{--}1.4\times$  its transverse diameter; hind margins of eye and temple subparallel. Face width  $1.3\text{--}1.5\times$  combined height of face and clypeus. Longitudinal diameter of eye  $3.2\text{--}3.6\times$  longer than malar space (anterior view). Malar suture absent. Width of hypoclypeal depression  $1.5\text{--}1.8\times$  distance from depression to eye. Antenna  $1.0\text{--}1.1\times$  as long as fore wing, with 27–32 antennomeres. First, middle and penultimate flagellomeres  $2.2\text{--}2.5\times$ ,  $1.5\text{--}1.9$ , and  $1.9\text{--}2.5\times$  longer than wide, respectively. Mesosoma  $1.6\times$  longer than its maximum height. Mesoscutum setose on notaulic area and with sparse setae medio-longitudinally. Notauli very deep anteriorly, impressed and almost united posteriorly. Mesepimeral and metapleural sulci smooth. Medio-longitudinal keel developed in apical third of propodeum, branching. Fore wing vein r arising from basal  $0.45\text{--}0.50$  of pterostigma; vein 1-R1  $1.4\text{--}1.8\times$  longer than pterostigma; marginal cell  $9\text{--}13\times$  longer than distance from its apex to apex of wing; vein 3-SR  $2.3\text{--}2.6\times$  vein r (Li et al. 2020b:  $3\times$ ),  $0.5\text{--}0.6\times$  vein SR1,  $1.2\text{--}1.4\times$  vein 2-SR (Li et al. 2020b:  $1.7\times$ ). Hind femur  $3.6\text{--}3.8\times$  longer than wide. Hind tibia with without subapical row of thick setae. Fifth segment of hind tarsus  $0.45\text{--}0.50\times$  and  $0.88\text{--}0.90\times$  as long as hind basitarsus and second segment, respectively. Fifth segment of hind tarsus as long as second segment. Claws with shortly protruding and blunt basal lobe. First metasomal tergite with incomplete dorsal carinae strongly curved towards apex of tergite and with developed dorsolateral carinae, its median length  $0.95\text{--}1.20\times$  its apical width. Second tergite with weak elongate-triangular median area and with more or less deep s-shaped crenulated dorsolateral impressions; medially  $0.90\text{--}1.15\times$  as long as third tergite; its basal width  $1.3\text{--}1.6\times$  its median length. Second metasomal suture deep, curved and crenulate. Apical margins of third to sixth tergites thin. Ovipositor sheath  $1.2\text{--}1.7\times$  longer than hind tibia and  $0.35\text{--}0.50\times$  as long as fore wing. Apex of ovipositor with developed nodus and ventral serration. Body mainly smooth; face medially weakly granulate under toruli, laterally almost smooth; frons weakly granulate; malar space granulate; first metasomal tergite obliquely rugulose posteriorly, second or second and third tergites striate-rugulose, fourth tergite with



rugulose to papillary-like sculpture, fifth and sixth tergites with weakening papillary-like sculpture or almost smooth (Li et al. 2020b: fig. 6e, metasomal sculpture strongly smoothed, second tergite weakly rugulose, third and fourth tergites weakly shagreen to smooth). Body mainly dark brown, most of legs and ventral side of metasoma yellow; head ventrally, scape, pronotum, tegula brownish yellow; maxillary palps pale yellow; wing membrane weakly darkened, pterostigma yellowish brown, veins pale brown.

**Diagnosis.** Relationships of *Bracon semitergalis* are listed in the diagnosis of *B. tergalis* (see below).

***Bracon (Bracon) sergeji* Tobias, 2000**

Figs 46–54, A5

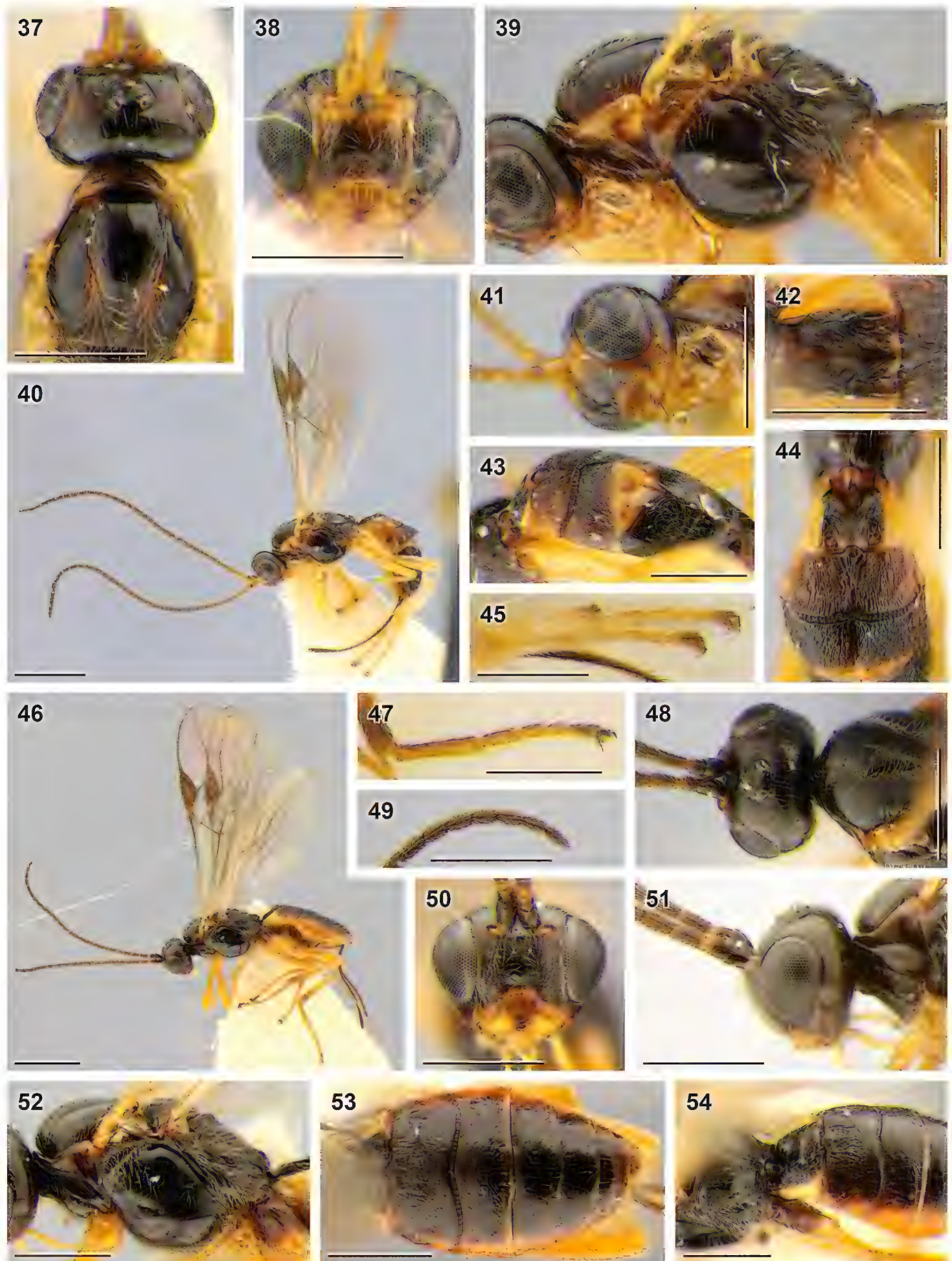
**Material.** SOUTH KOREA (5 females). – **Gyeonggi-do** • 1 female; Suwon-si, [37] Gwon-seon-gu, Seodun-dong, Yeogisan Mountain; 19 Aug. 1983; Y.I. Lee leg.; SMNE 756. – **Gyeongsangnam-do** • 1 female; Namhae-gun, [79] Idong-myeon, Sinjeon-ri, Geum-san Mountain; 21 Aug. 1992; D.-S. Ku leg.; SMNE 758. – **Jeollanam-do** • 1 female; Jangseong-gun, [80] Samgye-myeon, Singi-ri, Taechongsan Mountain, Bongjeongsa Temple; 11 Jul. 1998; D.-S. Ku leg.; light trap; NIBR 759 • 1 female; Yeosu-si, [84] Nam-myeon, Dumo-ri, Town Moha; 20 Jul. 1993; D.-S. Ku leg.; SMNE 749 • 1 female; Yeosu-si, [85] Nam-myeon, Yuseong-ri, Geumodo Island, Daedaesan Mountain; 3 Aug. 1993; D.-S. Ku leg.; ZISP 750.

**Additional material.** JAPAN – **Hokkaido Prefecture** • 1 female (paratype); Sapporo, Maruyama Mountain; 5 Sep. 1999; S.A. Belokobylskij leg.; ZISP A0045. – **Tochigi Prefecture** • 1 female (paratype); Nikko; 2–3 Oct. 1999; S.A. Belokobylskij leg.; ZISP A0046. – **Fukushima Prefecture** • 1 female (paratype); Hinoemata; 16–18 Aug. 1999; S.A. Belokobylskij leg.; ZISP A0047.

**Distribution.** Japan: Hokkaido, Honshu. South Korea (new record).

**Description. Female.** Fore wing length 2.7–3.7 mm. Width of head (dorsal view) 1.7–1.9× its median length. Transverse diameter of eye (dorsal view) 1.5–1.7× longer than temple. OOL 2.4–2.8× Od; POL 1.6–2.0× Od; OOL 1.4× POL. Longitudinal diameter of eye (lateral view) 1.4–1.6× its transverse diameter; hind margins of eye and temple subparallel. Face width 1.5–1.6× combined height of face and clypeus. Face width 1.9–2.4× larger than width of hypoclypeal depression. Longitudinal diameter of eye 2.9–3.5× longer than malar space (anterior view). Malar suture absent. Width of hypoclypeal depression 1.2–1.6× larger than distance from depression to eye. Antenna 0.84–0.90× as long as fore wing, with 25–27 antennomeres. First, middle and penultimate flagellomeres 1.9–2.3×, 1.5–2.2 × and 1.7–2.2× longer than wide, respectively. Mesosoma 1.4–1.6× longer than its maximum height. Mesoscutum setose on notaulic area, with sparse setae medio-longitudinally. Notauli very deep anteriorly, impressed and not united posteriorly. Mesepimeral and metapleural sulci smooth. Medio-longitudinal keel developed in apical third of propodeum, branching. Fore wing vein r arising from basal 0.40–0.45 of pterostigma; vein 1-R1 1.5× longer than pterostigma;





**Figures 37–54.** *Bracon (Bracon) semitergalis* Tobias, 2000 (37–45 holotype, female, ZISP) and *B. (B.) sergeji* Tobias, 2000 (46–54 paratype, female, ZISP) 37, 48 head and mesoscutum, dorsal view 38, 50 head, anterior view 39, 52 mesosoma, lateral view 40, 46 habitus, lateral view 41 head, ventrolateral view 42 first metasomal tergite, dorsal view 43 metasoma, dorsolateral view 44, 54 first–third metasomal tergites 45, 47 hind tarsus 49 apex of antenna 51 head, lateral view 53 metasoma, dorsal view. Scale bars: 0.5 mm (37–40, 41–45, 47–54); 1 mm (40, 46).



marginal cell 7–9× longer than distance from its apex to apex of wing; vein 3-SR 2.5–2.9× vein r, 0.55–0.70× vein SR1, 1.3–1.6× vein 2-SR. Hind femur 3.9–4.4× longer than wide. Hind tibia with 2 thick setae subapically. Fifth segment of hind tarsus 0.45–0.50× as long as hind basitarsus, 0.90–0.97× as long as second segment. Claws with acute angularly protruding basal lobe. First metasomal tergite with incomplete dorsal carina and developed dorsolateral carinae; its median length 0.80–0.93× its apical width. Second tergite without median area and with very shallow s-shaped weakly crenulate dorsolateral impressions not bordered by carinae; medially 1.0–1.2× longer than third tergite; its basal width 1.7–2.0× its median length. Second metasomal suture deep, curved and crenulate. Apical margins of third to sixth tergites thick, with weakly foveate transverse subapical grooves. Ovipositor sheath 1.3–1.4× longer than hind tibia, 0.37–0.41× as long as fore wing. Apex of ovipositor with weak nodus and distinct ventral serration. Body mainly smooth; frons, face, and malar space granulate; first tergite posteriorly rugose; second tergite laterally longitudinally rugulose, anteromedially rugose to rugulose; third tergite granulate-rugulose to weakly granulate; fourth–sixth tergites weakly granulate to smooth. Body mostly brownish black; legs and lateral sides of metasoma reddish brown; maxillary palps, basal half of hind tibia, and metasoma ventrally pale yellow; tegulae brownish yellow; wing membrane weakly darkened, pterostigma and veins brown.

**Diagnosis.** Relationships of *Bracon sergeji* are listed in the diagnosis of *B. tergalis* (see below).

***Bracon (Bracon) subcylindricus* Wesmael, 1838**

Figs 55–57, A5

**Material.** SOUTH KOREA (3 females, 7 males). – **Gangwon-do** • 1 female; Goseong-gun, [2] Ganseong-eup; 25 May 1993; D.-S. Ku leg.; NIBR 407 • 4 males; same data as for preceding; SMNE 408–411 • 1 female; Goseong-gun, [3] Geojin-eup, Naengcheon-ri, Geonbongsa Temple; 25 May 1993; D.-S. Ku leg.; ZISP 412 • 2 males; Chuncheon-si, [11] Dongsan-myeon, Joyang-ri, Joyang bridge; 24 May 1994; D.-S. Ku leg.; SMNE 414, 415 • 1 male; Pyeongchang-gun, [14] Jinbu-myeon, Dongsan-ri, Odaesan Mountain; 27 May 1993; D.-S. Ku leg.; SMNE 413. – **Chungcheongnam-do** • 1 female; Yesan-gun, [51] Deoksan-myeon, Sudeoksa Temple; 11 Aug. 1991; D.-S. Ku leg.; ZISP 406.

**Additional material.** **Astrakhan Province** • 2 females; Kamyzyaksky District, Astrakhan Nature Reserve, Damchiksky section; 19 Jul. 1974; V.V. Kostyukov leg.; Phragmites, Typha, Carex; ZISP A0057, A0058 • 1 female; same locality as for preceding; 21 Jul. 1974; V.V. Kostyukov leg.; Phragmites; ZISP A0059 • 1 female; Astrakhan, Gorodskoy Island; 26 Jun. 2004; S.A. Belokobylskij leg.; wet and dry meadows, forest; ZISP A0056.

**Chechen Republic** • 2 females (lectotype and paralectotype of *Bracon kiritshenkoi* Tengel, 1936); Kizlyar District, Starogladvskaya; 8 Jul. 1927; A.N. Kiritshenko leg.; ZISP.



**Volgograd Province** • 1 female; Pallasovskiy District, Lake Elton; 16 Jun. 2004; A.I. Khalaim leg.; Khara River, steppe; ZISP A0055.

**Distribution.** Caucasus. Europe: Eastern, Northern, Southern, and Western Europe. Iran. Kazakhstan. Russia: European part (Samartsev 2019); Ural. South Korea (new record). Turkey.

**Description. Female.** Fore wing length 3.0–4.8 mm. Width of head (dorsal view) 1.6–1.8× its median length. Transverse diameter of eye (dorsal view) 1.2–1.7× longer than temple. OOL 2.5–3.3× Od; POL 1.3–1.8× Od; OOL 1.8–2.1× POL. Longitudinal diameter of eye (lateral view) 1.4–1.6× its transverse diameter; hind margins of eye and temple subparallel to broadened downwards. Face width 1.6–1.7× combined height of face and clypeus. Longitudinal diameter of eye 2.4–2.9× longer than malar space (anterior view). Malar suture absent. Width of hypoclypeal depression 1.0–1.5× larger than distance from depression to eye. Antenna 1.1–1.2× longer than fore wing, with 33–43 antennomeres. First, middle and penultimate flagellomeres 1.7–2.1×, 1.3–1.7 ×, and 1.6–2.1× longer than wide, respectively. Mesosoma 1.7–1.9× longer than its maximum height. Mesoscutum setose only on notaulic area. Notauli deep anteriorly, shallow and united posteriorly. Mesepimeral and metapleural sulci (weakly) crenulate. Medio-longitudinal keel on propodeum complete, with transverse rugae. Fore wing 0.8–1.0× as long as body. Pterostigma 2.7–3.7× longer than wide; vein r arising from basal 0.45–0.55× of pterostigma; vein 1-R1 1.4–1.7× longer than pterostigma. Marginal cell 6–12× longer than distance from its apex to apex of wing; vein 3-SR 2.2–3.4× vein r, 0.60–0.85× vein SR1, 1.3–1.6× vein 2-SR. Hind femur 2.9–3.4× longer than wide. Hind tibia with subapical transverse row of thick setae. Fifth segment of hind tarsus 0.5–0.7× as long as hind basitarsus, 0.95–1.15× as long as second segment. Claws with small not protruding ventrally basal lobe. First metasomal tergite with complete or incomplete dorsal carina and developed dorsolateral carinae, its median length 0.7–0.8× its apical width. Metasoma 0.29–1.49× as long as mesosoma. Median length of first tergite. Second tergite without distinct median area and with shallow s-shaped weakly crenulate dorsolateral impressions not bordered by carinae; medially 0.9–1.1× as long as third tergite, its basal width 1.6–1.8× its median length. Second metasomal suture deep, curved and crenulate. Apical margins of third to sixth tergites more or less thick, without transverse subapical grooves. Ovipositor sheath 0.80–1.15× as long as hind tibia, 0.25–0.35× as long as fore wing. Apex of ovipositor with developed nodus and ventral serration. Body mainly smooth; face, frons, and malar space weakly granulate; propodeum posteriorly more or less rugose; first metasomal tergite posteriorly areolate-rugose; second tergite rugose to granulate-rugulose; third–sixth tergites with gradually weakening papillary-like sculpture. Coloration (Korean specimens): head, mesosoma and metasoma medio-longitudinally brownish black; tegula, legs, and lateral and ventral sides of metasoma reddish yellow; wing membrane more or less brownish darkened, pterostigma and wing veins brown.

**Remarks.** The key to related species and the taxonomic history of *B. subcylindricus* had been published earlier (Samartsev 2018, 2019).



***Bracon (Bracon) terebralis* Tobias, 2000**

Figs 59–67, A5

*Bracon terebralis* Tobias, 2000 in Belokobylskij and Tobias 2000: 138.*Bracon megaventrus* Li, He & Chen, 2020b: 227; syn. nov.

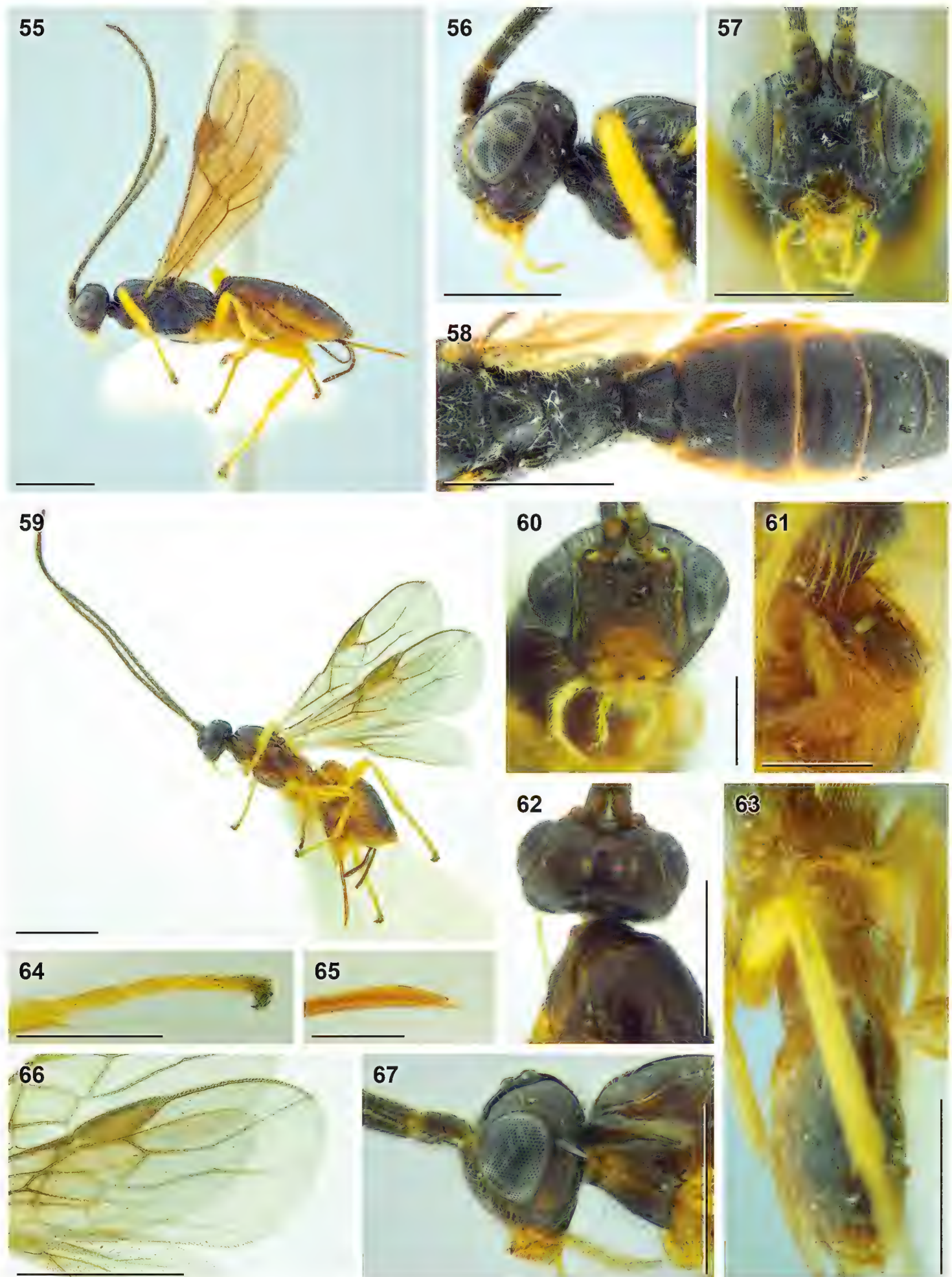
**Material.** SOUTH KOREA (13 females, 1 male). – **Gangwon-do** • 1 female; Sokcho-si, [7] Seorak-dong; 11 Jun. 1992; D.-S. Ku leg.; SMNE 961. – **Gyeonggi-do** • 4 females; Gapyeong-gun, [31] Cheongpyeong-myeon, Cheongpyeong-ri, Cheongpyeong Amusement Park; 14 Jun. 1992; D.-S. Ku leg.; SMNE 193, 423–425 • 1 male; same data as for preceding; SMNE 426 • 1 female; Suwon-si, [37] Gwonseon-gu, Seodundong, Yeogisan Mountain; 11 May 1994; D.-S. Ku leg.; SMNE 427 • 1 female; same data as for preceding; 26 May 1994; SMNE 428 • 2 females; same data as for preceding; 8 Jun. 1994; ZISP 430, 431 • 1 female; same data as for preceding; NIBR 432 • 2 females; same data as for preceding; SMNE 865, 913. – **Gyeongsangbuk-do** • 1 female; Bonghwa-gun, [41] Mulya-myeon, Ojeon-ri, Seondalsan Mountain; 28 May 1998; Jeong-Gyu Kim leg.; SMNE 429.

**Additional material.** RUSSIA – **Primorskiy Territory** • 1 female (holotype); Partizansky District, 10 km SE of Partizansk, Novitskoe; 20 Jul. 1984; S.A. Belokobylskij leg.; oak forest; ZISP.

**Distribution.** Russia: Far East: Primorskiy Territory. South Korea (new record).

**Description. Female.** Fore wing length 2.7–2.9 mm (Li et al. 2020b: 3.6 mm). Width of head (dorsal view) 1.7–1.8× its median length. Transverse diameter of eye (dorsal view) 1.8–2.1× longer than temple. OOL 2.2–2.8× Od; POL 1.3–1.6× Od; OOL 1.6–1.8× POL. Longitudinal diameter of eye (lateral view) 1.4–1.5× its transverse diameter; hind margins of eye and temple parallel to broadened downwards. Face width 1.5–1.6× combined height of face and clypeus. Longitudinal diameter of eye 2.4–3.2× longer than malar space (anterior view). Malar suture absent. Width of hypoclypeal depression 1.2–1.5× distance from depression to eye. Antenna 1.1–1.2× longer than fore wing, with 29–32 (Li et al. 2020b: 35) antennomeres. First, middle and penultimate flagellomeres 2.1–2.3×, 1.8–2.3× and 2.1–2.4× longer than wide, respectively. Mesosoma 1.8–2.0× longer than its maximum height. Mesoscutum setose on notaulic area and medioposteriorly. Notauli deep anteriorly, shallow and not united posteriorly. Mesepimeral and metapleural sulci smooth. Propodeum with short medio-longitudinal keel apically, branching. Fore wing vein r arising from basal 0.45–0.50 of pterostigma; vein 1-R1 1.4× longer than pterostigma; marginal cell 11–16× distance from its apex to apex of wing; vein 3-SR 2.7–3.5× vein r, 0.5–0.6× vein SR1, 1.2–1.5× vein 2-SR. Hind femur 2.7–3.1× longer than wide. Hind tibia without subapical row of thick setae. Fifth segment of hind tarsus 0.6–0.7× as long as hind basitarsus, 1.0–1.3× longer than second segment. Claws with large, more or less angularly protruding basal lobe. First metasomal tergite with incomplete dorsal carinae more or less strongly curved towards apex of tergite and with weakly separated dorsolateral carinae, its median length 0.95–1.10× as large as





**Figures 55–67.** *Bracon (Bracon) subcylindricus* Wesmael, 1838 (**55–57** female, NIBR **58** female, ZISP) and *B. (B.) terebralis* Tobias, 2000 (**59–63** holotype, female, ZISP) **55, 59** habitus, lateral view **56, 67** head, lateral view **57, 60** head, anterior view **58, 63** metasoma and propodeum, dorsal view **61** first metasomal tergite, dorsolateral view **62** head, dorsal view **64** hind tarsus **65** apex of ovipositor **66** apex of fore wing. Scale bars: 0.25 mm (**60, 61, 65**); 0.5 mm (**56, 57, 62–64, 67**); 1 mm (**55, 59, 66**).



its apical width. Second tergite with very short triangle weakly elevated median area and without dorsolateral impressions; medially  $0.86\text{--}0.97\times$  as long as third tergite; its basal width  $1.4\text{--}1.6\times$  its median length. Apical margins of third–sixth tergites thin. Ovipositor sheath  $0.75\text{--}0.90\times$  as long as hind tibia,  $0.20\text{--}0.25\times$  as long as fore wing. Apex of ovipositor with weak nodus and weak ventral serration. Body mostly smooth; face and frons smooth; malar space granulate; propodeum rugulose near its posterior margin; first metasomal tergite laterally weakly rugulose, its median area obliquely rugulose posteriorly; second tergite rugulose to almost smooth; third tergite weakly granulate to smooth; posterior tergites smooth. Body mostly brownish black; legs and desclerotised parts of metasomal sterna yellow; maxillary palps pale yellow; tegulae yellow or brownish yellow; wing membrane weakly brownish darkened, pterostigma brown and wing veins brown.

**Diagnosis.** *Bracon terebralis* differs from other species of the section *Orthobracon* Fahringer sec. Tobias (1986) by a combination of the short ovipositor, strongly smoothed sculpture on head (Fig. 60), propodeum, and metasoma (Fig. 63), and by the long antenna with ca. 30–35 segments (Fig. 59).

***Bracon (Bracon) tergalis* Tobias, 2000**

Figs 68–76, A6

**Material.** SOUTH KOREA (20 females, 4 males). – **Gangwon-do** • 1 female; Goseong-gun, [3] Geojin-eup, Naengcheon-ri, Geonbongsa Temple; 22 May 1992; D.-S. Ku leg.; SMNE 1537 • 1 female; Goseong-gun, [5] Toseong-myeon, Sinpyeong-ri, Seoraksan Mountain; 2 Aug. – 19 Oct. 2002; D.-S. Ku leg.; Malaise trap; SMNE 778 • 1 female; Yeongwol-gun, [18] Hanbando-myeon, Ssangyong-ri; 24 May 1993; D.-S. Ku leg.; SMNE 752 • 1 female; Taebaek-si, [22] Cheoram-dong, Taebaeksan Mountain; 23 Jun. 1989; D.-S. Ku leg.; SMNE 753 • 1 female; same data as for preceding; 20 Jun. 1991; SMNE 771. – **Gyeonggi-do** • 1 female; Pocheon-si, [24] Idong-myeon, Dopyeong-ri, Valley Baekun; 13 Jun. 1996; H.J. Cheon leg.; SMNE 757 • 1 female; Yangju-si, [29] Nam-myeon; 12 Jun. 1996; H.J. Cheon leg.; SMNE 776 • 1 male; Gapyeong-gun, [30] Buk-myeon, Dodae-ri, Myeongjisan Mountain; 14 Jun. 1992; D.-S. Ku leg.; SMNE 783 • 1 male; same data as for preceding; ZISP 784 • 1 female; Gapyeong-gun, [31] Cheongpyeong-myeon, Cheongpyeong-ri, Cheongpyeong Amusement Park; 14 Jun. 1992; D.-S. Ku leg.; SMNE 781 • 1 female; same data as for preceding; ZISP 782 • 1 male; Suwon-si, [37] Gwonseon-gu, Seodun-dong, Yeogisan Mountain; 8 Jun. 1994; D.-S. Ku leg.; SMNE 1057 • 1 female; Suwon-si, [38] Gwonseon-gu, Seodun-dong; 27–29 Apr. 1994; D.-S. Ku leg.; Malaise trap; ZISP 1153 • 1 female; same data as for preceding; 25 Apr. 1994; SMNE 770 • 1 female; Hwaseong-si, [39] Bibong-myeon; 1 Jun. 1994; D.-S. Ku leg.; SMNE 751. – **Gyeongsangbuk-do** • 1 male; Bonghwa-gun, [40] Seokpo-myeon, Seokpo-ri; 28 May 1993; D.-S. Ku leg.; SMNE 779. – **Chungcheongnam-do** • 1 female; Yesan-gun, [51] Deoksan-myeon, Sudeoksa Temple; 11 Aug. 1991; D.-S. Ku leg.; NIBR 1009 • 1 female; Geumsan-gun, [54] Nami-myeon, Boseok Temple; 5–9 Jun. 1998; Pierre Tripotin leg.; Malaise trap; SMNE 780. – **Chungcheongbuk-**

**do** • 1 female; Jecheon-si, [55] Geumseong-myeon, Seongnae-ri; 10 Jun. 1992; D.-S. Ku leg.; SMNE 777. – **Gyeongsangnam-do** • 1 female; Goseong-gun, [64] Sangni-myeon, Bupo-ri; 3 May 1993; D.-S. Ku leg.; SMNE 1105 • 1 female; Jinju-si, [72] Gajwa-dong; 25 Oct. 1993; D.-S. Ku leg.; SMNE 773 • 1 female; same data as for preceding; 6 Jun. 1993; SMNE 774 • 1 female; Jinju-si, [74] Naedong-myeon, Naepyeong-ri; 30–31 May 1993; D.-S. Ku leg.; SMNE 772. – **Jeollanam-do** • 1 female; Gurye-gun, [82] Toji-myeon, Oegok-ri, Jirisan Mountain (Piagol); 24 Jan. 1995; S.H. Lee leg.; SMNE 775.

**Additional material.** RUSSIA – **Primorskiy Territory** • 1 female (holotype); Khasansky District, env. Khasan; 25 May 1979; S.Yu. Storozhenko, V.S. Sidorenko leg.; oak forest; ZISP • 1 female; Lazovsky District, 18 km SE of Lazo, State Reserve of Lazo, cordon America; 24–29 Aug. 2006; S.A. Belokobylskij leg.; forest edges, clearings; ZISP A0050 • 1 female; Shkotovsky District, Ussurisky Nature Reserve; 25 Aug. 2001; S.Yu. Storozhenko and V.S. Sidorenko leg.; ZISP A0042.

**Distribution.** Russia: Far East: Primorskiy Territory; South Korea (new record).

**Description. Female.** Fore wing length 3.2–4.0 mm. Width of head (dorsal view) 1.7–1.9× its median length. Transverse diameter of eye (dorsal view) 1.7–2.2× longer than temple. OOL 2.1–2.7× Od; POL 0.93–1.83× Od; OOL 1.5–2.3× POL. Longitudinal diameter of eye (lateral view) 1.3–1.5× its transverse diameter; hind margins of eye and temple subparallel. Face width 1.4–1.6× combined height of face and clypeus. Longitudinal diameter of eye 3.1–3.3× longer than malar space (anterior view). Malar suture absent. Width of hypoclypeal depression 1.5–1.6× larger than distance from depression to eye. Antenna 0.75–1.10× as long as fore wing, with 27–34 antennomeres. First, middle and penultimate flagellomeres 1.8–2.5×, 1.4–2.2×, and 1.8–2.2× longer than wide, respectively. Mesosoma 1.5–1.6× longer than its maximum height. Mesoscutum widely setose on notaulic area and posteriorly, often with sparse setae medio-longitudinally. Notauli deep anteriorly, shallow and united posteriorly. Mese-pimeral sulcus smooth, metapleural sulcus crenulate. Medio-longitudinal keel more or less developed in apical third of propodeum, branching. Fore wing vein r arising from basal 0.40–0.48 of pterostigma; vein 1-R1 1.5–1.8× as long as pterostigma; marginal cell 8.5–13.5× longer than distance from its apex to apex of wing; vein 3-SR 2.3–2.9× vein r, 0.52–0.64× as long as vein SR1, 1.3–1.5× vein 2-SR. Hind femur 3.4–4.3× longer than wide. Hind tibia without subapical row of thick setae. Fifth segment of hind tarsus 0.4–0.5× as long as hind basitarsus and 0.85–1.00× as long as its second segment. Claws with shortly protruding and blunt basal lobes. First metasomal tergite with incomplete or complete dorsal carina and developed dorsolateral carinae, its median length 0.83–0.96× its apical width. Second tergite with weak, narrow, longitudinal median area and with more or less deep s-shaped crenulate dorsolateral impressions not bordered by carinae; medially 1.0–1.3× longer than third tergite; its basal width 1.6–1.8× its median length. Second metasomal suture deep, curved and crenulate. Apical margins of third–sixth tergites more or less thick. Ovipositor sheath 1.3–1.7× as long as hind tibia and 0.37–0.49× as long as fore wing. Apex of ovipositor with weak nodus and weak ventral serration. Body mainly smooth; face and frons weakly granulate, malar space granulate; mesopleuron smooth or partially with weak coriaceous



sculpture; propodeum posteriorly almost smooth or weakly granulate; first metasomal tergite laterally weakly rugulose, posteriorly rugose; second tergite striate-rugulose or rugose to rugulose; posterior tergites with weakening papillary-like sculpture. Head, mesosoma and metasoma dorsally brownish black; head ventrally, pronotum, and mesoscutum along notauli, lateral margins of metasoma rusty brown or reddish yellow; tegula and legs brownish yellow; maxillary palps pale yellow; wing membrane weakly darkened, pterostigma brown, wing veins yellowish brown to brown.

**Diagnosis.** *Bracon tergalis* may be compared with *B. sergeji* and *B. semitergalis*. The differences between three species are presented in the key below.

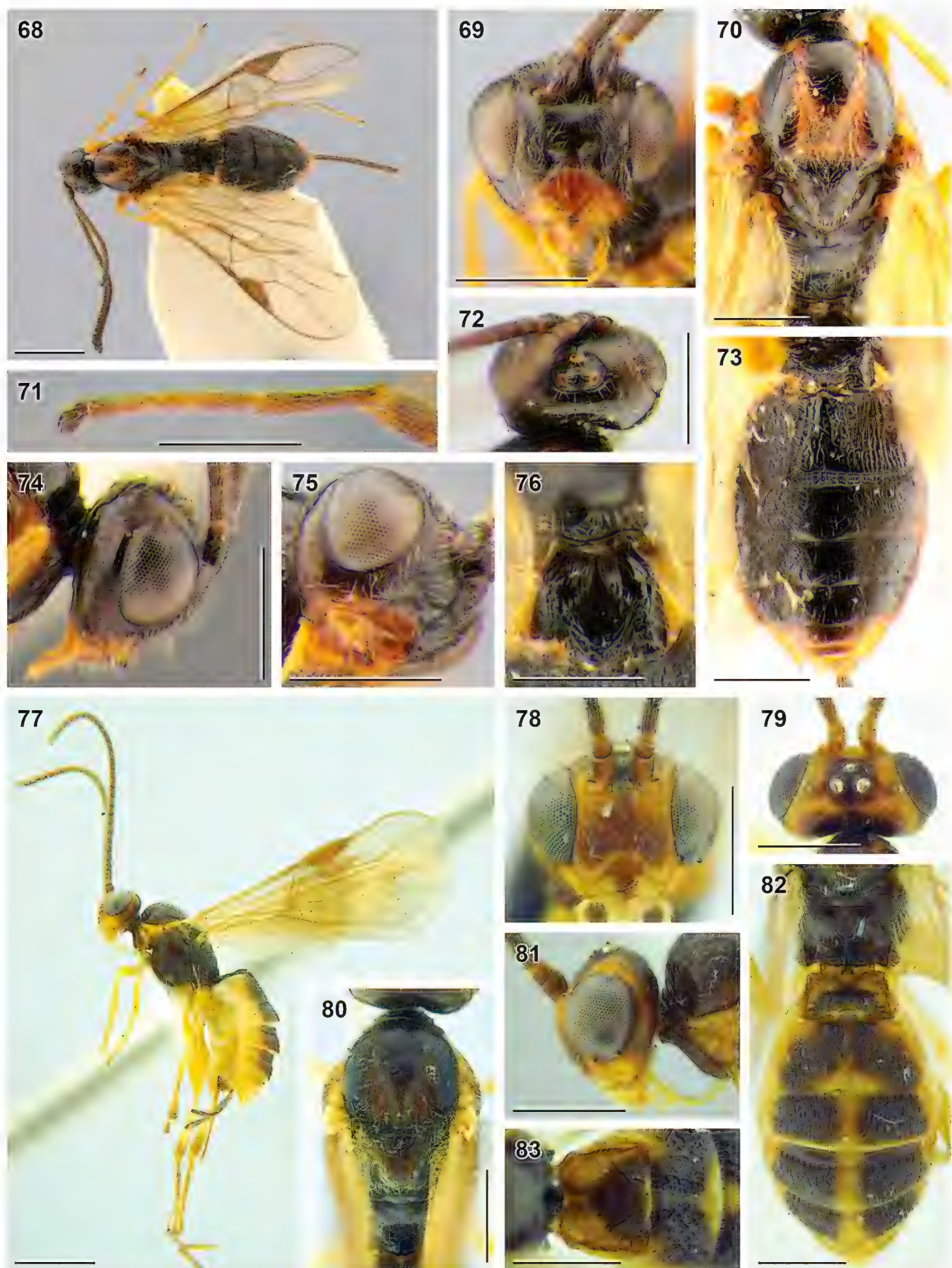
- 1 Face almost smooth, weakly granulate laterally and under toruli (Figs 38, 41). Median area of second metasomal tergite distinct, triangle and elongate (Fig. 44). Scape brownish yellow (Fig. 38). Median length of first tergite 0.95–1.20× its apical width (Fig. 42). Basal width of second metasomal tergite 1.3–1.6× its median length (Fig. 44) ..... ***Bracon (Bracon) semitergalis* Tobias**
- Face mostly granulate (Figs 50, 69, 75). Median area of second metasomal tergite weakly defined, longitudinal (Fig. 73) or triangle, but short (Fig. 54). Scape dark-coloured (Figs 51, 69). Median length of first tergite 0.80–0.95× its apical width (Figs 54, 76). Basal width of second metasomal tergite 1.6–2.0× its median length (Figs 53, 73) ..... **2**
- 2 Second metasomal tergite with weaker sculpture, rugose to rugulose (Figs 53, 54). Apical margins of third to sixth tergites with shallow weakly crenulate transverse subapical grooves. Transverse pronotal and metapleural sulci smooth (Fig. 52) ..... ***Bracon (B.) sergeji* Tobias**
- Second metasomal tergite with coarser sculpture, distinctly longitudinally striate-rugose (Fig. 73). Apical margins of third to sixth tergites without subapical grooves. Transverse pronotal and metapleural sulci crenulate..... ***Bracon (B.) tergalis* Tobias**

**Remarks.** The differences between *B. tergalis* and *B. sergeji* are very weak, but persistent in the series of specimens of similar size. Because it is possible to separate two species using these characters, we treat them as valid species.

### ***Bracon (Bracon) virgatus* Marshall, 1897**

Figs 77–83, A7

**Material.** SOUTH KOREA (9 females). – **Gyeonggi-do** • 1 female; Suwon-si, [37] Gwonseon-gu, Seodun-dong, Yeogisan Mountain; 29 May – 6 Jul. 1994; D.-S. Ku leg.; Malaise trap; NIBR 942 • 1 female; same data as for preceding; 23–29 Jun. 1994; ZISP 939 • 1 female; same locality as in preceding; 10 Jul. 1995; June-Yeol Choi leg.; Malaise trap; SMNE 935 • 1 female; same data as for preceding; 7 Aug. 1995; SMNE



**Figures 68–83.** *Bracon (Bracon) tergalis* Tobias, 2000 (**68–76** holotype, female, ZISP) and *B. (B.) virgatus* Marshall, 1897 (**77, 78, 80, 81** female, SMNE **79, 82, 83** female, ZISP) **68** habitus, dorsal view **69, 78** head, anterior view **70, 80** mesosoma, dorsal view **71** hind tarsus habitus, lateral view **72, 79** head, dorsal view **73, 82** metasoma, dorsal view **74, 83** head, lateral view **75** head, ventrolateral view **76, 83** first metasomal tergite, dorsal view. Scale bars: 0.5 mm (**69–73, 78–83**); 1 mm (**68, 77**).



940 • 1 female; same data as for preceding; 3 Jun. 1996; SMNE 932 • 1 female; same data as for preceding; 30 Jun. 1997; SMNE 933 • 1 female; same locality as in preceding; 5 Aug. 1997; June-Yeol Choi leg.; SMNE 934 • 1 female; same data as for preceding; 25 Aug. 1997; June-Yeol Choi leg.; Malaise trap; ZISP 936. – **Gyeong-sangbuk-do** • 1 female; Bonghwa-gun, [43] Myeongho-myeon; 28 May 1993; D.-S. Ku leg.; SMNE 941.

**Additional material.** NETHERLANDS • 1 female (holotype of *Bracon lineifer* van Achterberg, 1988); Waarder, Oosteinde, 33; 5–7 Aug. 1973; C. van Achterberg leg.; RMNH.

**Distribution.** Europe: Eastern Europe: Hungary; Western Europe: Great Britain, the Netherlands, Switzerland. South Korea (new record).

**Description. Female.** Fore wing length 2.9–3.3 mm. Width of head (dorsal view) 2.0–2.1× its median length. Transverse diameter of eye (dorsal view) 2.3–2.5× longer than temple. OOL 1.9–2.0× Od; POL 0.95–1.10× Od; OOL 1.8–2.0× POL. Longitudinal diameter of eye (lateral view) 1.3× larger than its transverse diameter; hind margins of eye and temple subparallel. Face width 1.4–1.5× combined height of face and clypeus. Face width 2.3× larger than width of hypoclypeal depression. Longitudinal diameter of eye 3.1–3.2× longer than malar space (anterior view). Malar suture deep under eye, weak near mandible, smooth. Width of hypoclypeal depression 1.1–1.2× larger than distance from depression to eye. Antenna about 0.9× as long as fore wing, with 26–30 antennomeres. First, middle and penultimate flagellomeres 1.7–1.8×, 1.5–1.9×, and about 2.0× longer than wide, respectively. Mesosoma 1.4–1.5× longer than its maximum height. Mesoscutum evenly, but sparsely setose. Notauli very deep anteriorly, impressed and not united posteriorly. Mesepimeral and metapleural sulci smooth. Medio-longitudinal keel developed in apical half of propodeum, branching. Fore wing vein r arising from basal 0.45–0.50 of pterostigma; vein 1-R1 1.5–1.6× longer than pterostigma; marginal cell 10–11× longer than distance from its apex to apex of wing; vein 3-SR 2.0–2.4× vein r, about 0.55× vein SR1, 1.3–1.5× vein 2-SR. Hind femur 3.5–4.1× longer than wide. Hind tibia with without subapical row of thick setae. Fifth segment of hind tarsus 0.5–0.6× as long as hind basitarsus, 0.9–1.0× as long as second segment. Claws with long triangularly protruding acute basal lobe. First metasomal tergite with complete dorsal carina and developed dorsolateral carinae, its median length 0.76–0.82× its apical width. Second metasomal tergite with weak, narrow, longitudinal median area and with deep s-shaped crenulate dorsolateral impressions bordered by long carinae; medially 1.2× longer than third tergite; its basal width 1.6× its median length. Apical margins of third to sixth tergites thick, without transverse subapical grooves. Ovipositor sheath 0.96–0.98× as long as hind tibia, 0.25–0.27× as long as fore wing. Apex of ovipositor with developed nodus and weak ventral serration. Head and mesosoma almost entirely smooth (only face and frons with vague granulate sculpture); apical two thirds of propodeum with tree-like rugosity; first metasomal tergite rugose posteriorly and laterally; second tergite areolate-rugose, third tergite areolate-rugose to foveate, fourth–fifth tergites irregularly foveate, sixth tergite

smooth. Head and mesosoma dark brown with yellowish brown (or rusty) pattern, metasoma dorsally dark brown with yellow medio-longitudinal stripe and lateral and ventral sides; scape and tegula rusty; palps and legs yellow; wing membrane weakly darkened, pterostigma and wing veins brown.

**Diagnosis.** *Bracon virgatus* Marshall is similar to *B. imbricatellus* Tobias; their differences are listed below. Both species may be also compared with the *B. sculptithorax* species group (see Samartsev and Ku 2020: 18), but differ by the absence of granulate sculpture on gena, vertex, mesopleuron, and mesoscutum.

- |   |  |  |
|---|--|--|
| 1 | Transverse diameter of eye in dorsal view 1.6–2.0× temple (Fig. 27), in lateral view, 1.5–2.1× minimum width of temple (Fig. 24). Mesosoma 1.7–1.8× longer than its maximum height. Hind femur 3.0–3.4× longer than wide. Anterolateral areas of second metasomal tergite weakly separated by having smoothed sculpture (Figs 25, 26, 28). Apical margins of third to sixth metasomal tergites with weakly foveate transverse subapical grooves (Fig. 26). Spiracle of second metasomal tergite located in middle of tergite (Fig. 28). Propodeal spiracle located in middle of propodeum (lateral view) ..... | <b><i>Bracon (Bracon) imbricatellus</i> Tobias</b> |
| – | Transverse diameter of eye in dorsal view 2.3–2.5× temple (Fig. 79), in lateral view, 2.7–3.4× minimum width of temple (Fig. 81). Mesosoma 1.4–1.5× longer than its maximum height (Fig. 77). Hind femur 3.5–4.1× longer than wide. Anterolateral areas of second metasomal tergite not separated (Figs 82, 83). Apical margins of third to sixth metasomal tergites without transverse subapical grooves. Spiracle of second metasomal tergite located in anterior part of tergite (Fig. 82). Propodeal spiracle located behind middle of propodeum (lateral view) .....                                      | <b><i>Bracon (B.) virgatus</i> Marshall</b>        |

**Remarks.** The type of *B. virgatus* was not examined for the current study. Our taxon concept of the species is based on the examination of the type of *B. lineifer* van Achterberg, 1988, which was synonymised with *B. virgatus* by Papp (1999), however, without due justification. The specimens from South Korea differ from the type of *B. lineifer* by weakly sculptured, almost smooth face and frons (Fig. 78).

### ***Bracon (Bracon) yasudai* Maeto & Uesato, 2007**

Fig. A7

**Material.** SOUTH KOREA – **Gangwon-do** • 1 female; Yeongwol-gun, [19] Kimsatgatmyeon, Nae-ri, Daeyachi Town; 28 May 1998; Jeong-Gyu Kim leg.; NIBR 677.

**Distribution.** Japan: Ryukyu. South Korea (new record).

**Remarks.** The detailed description of the species (Maeto and Uesato 2007: 56) provides all necessary characters for its identification.



***Bracon (Habrobracon) nigricans* (Szépligeti, 1901)**

Fig. A7

**Material.** SOUTH KOREA (2 females, 1 male). – **Gyeonggi-do** • 1 female; Suwon-si, [38] Gwonseon-gu, Seodun-dong; 12 May 1983; Y.I. Lee leg.; NIBR 568. – **Gyeongsangbuk-do** • 1 female; Gyeongju-si, [48] Hyeongok-myeon, Geumjang-ri, Bridge Geumjang; 20 Jun. 1992; D.-S. Ku leg.; ZISP 567. – **Chungcheongnam-do** • 1 male; Geumsan-gun, [53] Chubu-myeon, Seongdang-ri, Gaedeoksa Temple; 22 May 1993; D.-S. Ku leg.; SMNE 569.

**Additional material.** CHINA – **Qinghai** • 2 females (lectotype and paralectotype of *Habrobracon mongolicus* Telenga, 1936); Eastern Tsaidam, Keluke Lake, Bayingoule River; 21 May 1895; V.I. Roborovsky and P.K. Kozlov leg.; ZISP • 2 females (paralectotypes of *H. mongolicus* Telenga); same data as for preceding; 28 May 1895; ZISP.

HUNGARY • 1 male (lectotype of *Habrobracon nigricans* Szépligeti, 1901); Budapest; 5 Jul. 1899; HNHM Hym.Typ.No.995.

**Distribution.** Caucasus. Central Asia. China: Fujian, Ningxia Hui, Qinghai (Samartsev 2019), Shaanxi, Xinjiang. Europe: Eastern, Northern, Southern, and Western Europe. Iran. Kazakhstan. Mongolia. North Africa: Tunisia. Russia: Eastern Siberia: Tyva Republic (Samartsev 2019); European part; Far East: Chukotka Autonomous Area (Samartsev 2019), Khabarovsk Territory, Primorskiy Territory, Sakhalin Island; Ural (Kostromina 2010). South Korea (new record). Turkey.

**Description. Female.** Fore wing length 2.5–2.6 mm. Width of head (dorsal view) 1.8–1.9× its median length. Transverse diameter of eye (dorsal view) 1.5–2.0× longer than temple. OOL 3.0–3.6× Od; POL 1.9–2.1× Od; OOL 1.6–1.7× POL. Longitudinal diameter of eye (lateral view) 1.6× larger than its transverse diameter; hind margins of eye and temple broadened downwards. Face width ca. 1.7× combined height of face and clypeus. Longitudinal diameter of eye 2.4–2.7× longer than malar space (anterior view). Malar suture absent. Width of hypoclypeal depression about 1.4× distance from depression to eye. Antenna 0.70–0.85× as long as fore wing, with 21–23 antennomeres. First, middle and penultimate flagellomeres 1.8–2.0×, 1.6–1.8×, and 1.5× longer than wide, respectively. Mesosoma 1.4–1.5× longer than its maximum height. Mesoscutum evenly setose. Notauli not impressed. Fore wing vein r arising from basal 0.47–0.50× of pterostigma; vein 1-R1 1.3× longer than pterostigma; marginal cell 1.5–2.1× longer than distance from its apex to apex of wing; vein 3-SR 0.75–0.90× vein r, 0.25–0.30× vein SR1, 0.73–0.88× vein 2-SR. Hind femur 3.8–3.9× longer than wide. Fifth segment of hind tarsus 0.5× as long as hind basitarsus, about 0.75× as long as second segment. Claws with small rectangular basal lobe. First metasomal tergite without dorsal and dorsolateral carinae, its median length 0.9× its apical width. Second metasomal tergite without median area and dorsolateral impressions; medially 1.1× longer than third tergite; its basal width about 1.8× its median length. Ovipositor sheath about 0.9× as long as hind tibia, about 0.3× as long as fore wing. Apex of ovipositor with developed nodus and ventral serration. Body mostly granulate, second metasomal tergite medially rugulose-punctate. Body mainly brownish black with reddish yellow to

yellowish brown maxillary palp, tegula, pattern on legs, patches along eye and on latero-posterior corners of second metasomal tergite; wing membrane weakly darkened, pterostigma and veins yellowish brown.

**Diagnosis.** The diagnosis of the species and its taxonomic literature were presented by Samartsev (2019: 62).

***Bracon (Habrobracon) stabilis* Wesmael, 1838**

Figs 84–86, A7

**Material.** SOUTH KOREA (1 female, 2 males). – **Gyeonggi-do** • 1 male; Suwon-si, [38] Gwonseon-gu, Seodun-dong; 15 Jun. 1994; D.-S. Ku leg.; SMNE 565. – **Gyeong-sangbuk-do** • 1 female; Bonghwa-gun, [42] Beopjeon-myeon, Eoji-ri, Norujae mountain pass; 28 May 1993; D.-S. Ku leg.; ZISP 564. – **Chungcheongbuk-do** • 1 male; Goesan-gun, [60] Cheongcheon-myeon, Sagimak-ri, Mindung Mountain; 23 May 1993; D.-S. Ku leg.; NIBR 566.

**Additional material.** BELGIUM • female (lectotype); Brussels; IRSNB • 7 females (paralectotypes); Brussels; IRSNB • 2 males (paralectotypes); Brussels; IRSNB.

RUSSIA – **Samara Province** • 1 female; Bogatovsky District, 6 km NE of Belovka, near Kutuluk storage pond; 31 Jul. 2010; K. Samartsev leg.; steppe, meadow herbs in ravine; ZISP A0120.

**Distribution.** Caucasus. China: Fujian, Xinjiang. Cyprus. Europe: Eastern, Northern, Southern and Western Europe. Iran. Israel. Kazakhstan. North Africa: Tunisia. North America. Russia: Eastern Siberia: Buryatia Republic, Irkutsk Province, Zabaikalskiy Territory; European part; Far East: Primorskiy Territory, Sakhalin Island; Western Siberia: Kemerovo Province (Tobias 1971). South Korea (new record). Turkey.

**Description. Female.** Fore wing length 3.1–3.7 mm. Width of head (dorsal view) 1.9–2.0× its median length. Transverse diameter of eye (dorsal view) 1.6–1.8× longer than temple. OOL 2.0–2.9× Od; POL 1.3–2.0× Od; OOL 1.4–1.6× POL. Longitudinal diameter of eye (lateral view) 1.5× larger than its transverse diameter; hind margins of eye and temple subparallel. Face width 1.6–1.7× combined height of face and clypeus. Longitudinal diameter of eye 2.3–2.6× longer than malar space (anterior view). Malar suture absent. Width of hypoclypeal depression 1.0–1.2× distance from depression to eye. Antenna 0.55–0.75× as long as fore wing, with ca. 24 antennomeres. First, middle and penultimate flagellomeres 1.6–2.3×, 1.6–1.9×, and 1.6–1.9× longer than wide, respectively. Mesosoma about 1.4× longer than its maximum height. Mesoscutum evenly, but sparsely setose. Notauli weakly impressed and not united posteriorly. Medio-longitudinal keel developed in apical third of propodeum, simple. Fore wing vein r arising from basal 0.45–0.48× of pterostigma. Vein 1-R1 1.3–1.4× longer than pterostigma. Marginal cell 2.5–4.5× longer than distance from its apex to apex of wing. Vein 3-SR 1.3–1.7× vein r, about 0.35× vein SR1, 0.90–0.95× vein 2-SR. Hind femur 4.2–4.3× longer than wide. Fifth segment of hind tarsus 0.45–0.48× as long as hind basitarsus and about 0.8× as long as second segment. Claws protruding



triangular basal lobes. First metasomal tergite without dorsal and dorsolateral carinae, its median length 0.7–0.9× its apical width. Second metasomal tergite without median area and dorsolateral impressions; medially 1.0–1.2× longer than third tergite; its basal width about 1.9–2.0× its median length. Second metasomal suture deep, curved and crenulate. Apex of ovipositor with weak nodus and weak ventral serration. Body mostly granulate; submedian longitudinal stripes on mesoscutum smooth; second tergite anteromedially granulate-rugulose. Body mainly brownish black with reddish yellow pattern on head, mesoscutum and legs; maxillary palp brown; wing membrane brownish darkened, pterostigma brown with yellowish patch basally, wing veins brown.

**Diagnosis.** *Bracon stabilis* may be identified using the key provided in Loni et al. (2016: 138).

***Bracon (Orientobracon) maculaverticalis* Li, He & Chen, 2016**

Fig. A8

**Material.** SOUTH KOREA (2 males). – **Gangwon-do** • 1 male; Goseong-gun, [4] Ganseong-eup, Jinbu-ri; 12 Jun. 1992; D.-S. Ku leg.; NIBR 16. – **Gyeongsangbuk-do** • 1 male; Gyeongsan-si, [49] Yeongnam University, Department of Biology; 20–26 Jun. 1989; J.S. Park leg.; SMNE 17.

**Distribution.** China (Li et al. 2016): Guizhou, Zhejiang. South Korea (new record).

**Remarks.** The detailed description and diagnosis of the species are provided in Li et al. (2016: 463).

***Bracon (Osculobracon) cingillus* Tobias, 2000**

Figs 87–92, A8

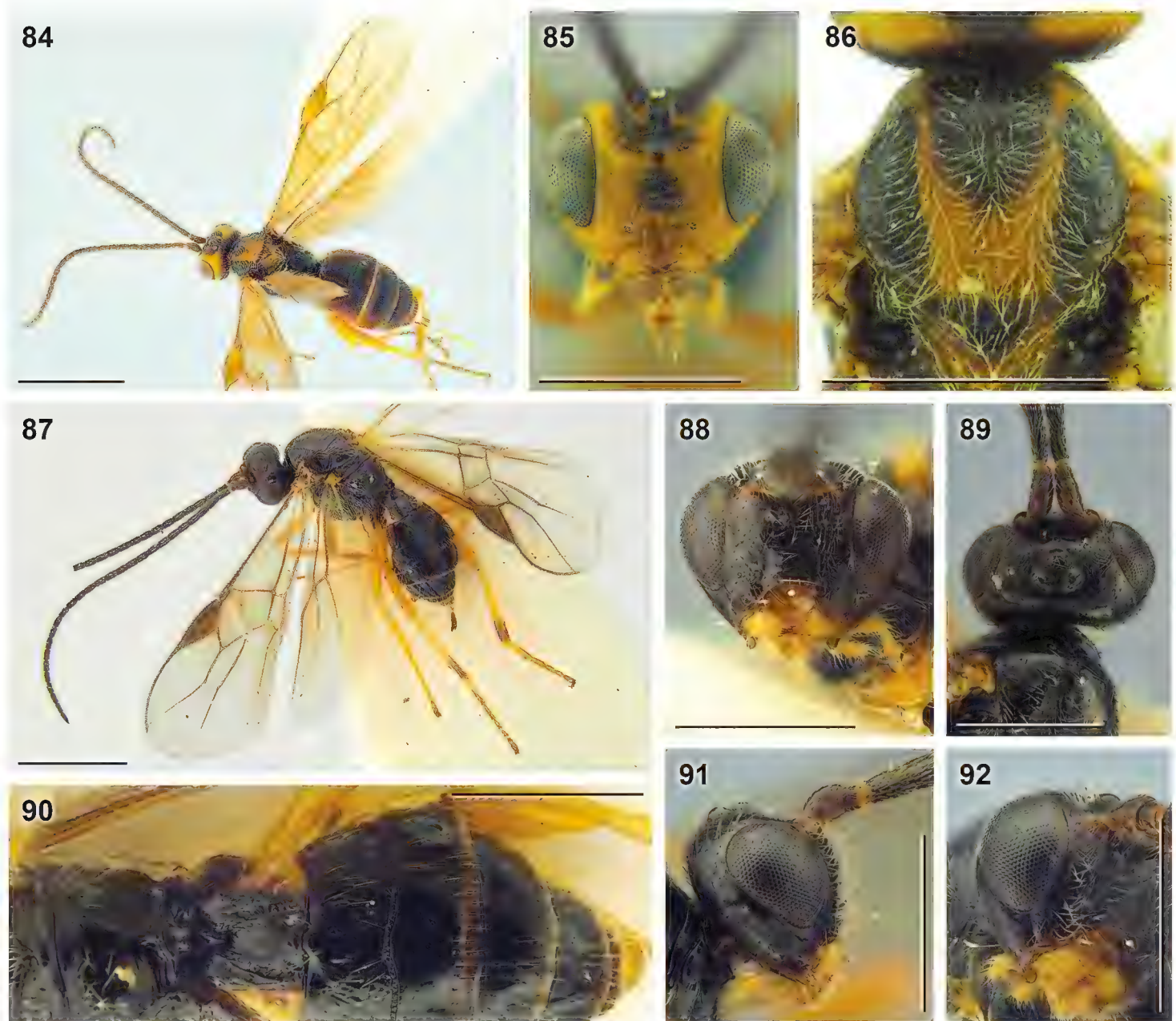
**Material.** SOUTH KOREA (3 females). – **Gangwon-do** • 1 female; Hongcheon-gun, [13] Naechon-myeon, Waya-ri, Baegamsan Mountain; 1 Sep. – 18 Oct. 2002; D.-S. Ku leg.; Malaise trap; SMNE 303. – **Chungcheongnam-do** • 1 female; Gongju-si, [52] Banpo-myeon, Hakbong-ri; 15 Jun. 1992; D.-S. Ku leg.; NIBR 310. – **Gyeongsangnam-do** • 1 female; Uiryeong-gun, [67] Garye-myeon, Gapeul-ri, Jagulsan Mountain; 12 Jun. 1990; D.-S. Ku leg.; ZISP 309.

**Additional material.** JAPAN – **Tochigi Prefecture** • 1 female (paratype); Nikko; 2–3 Oct. 1999; S.A. Belokobylskij leg.; ZISP.

RUSSIA – **Primorskiy Territory** • 1 female (holotype); Chernigovsky District, 10 km SE of Chernigovka; 28 Aug. 1996; S.A. Belokobylskij leg.; forest; ZISP.

**Distribution.** Japan: Hokkaido, Honshu. Russia: Far East: Primorskiy Territory. South Korea (new record).

**Description. Female.** Fore wing length 2.5–3.4 mm. Width of head (dorsal view) 1.8–2.0× its median length. Transverse diameter of eye (dorsal view) 1.7–2.1× longer



**Figures 84–92.** *Bracon* (*Habrobracon*) *stabilis* Wesmael, 1838 (**84–86** female, ZISP) and *B.* (*Osculobracon*) *cingillus* Tobias, 2000 (**87–92** holotype, female, ZISP) **84, 87** habitus, dorsal view **95, 88** head, anterior view **86** mesoscutum, dorsal view **89** head, dorsal view **90** metasoma and propodeum, dorsal view **91** head, lateral view **92** head, ventrolateral view. Scale bars: 0.5 mm (**85, 86, 88–92**); 1 mm (**84, 87**).

than temple. OOL  $2.3\text{--}2.4\times$  Od; POL  $1.2\text{--}1.4\times$  Od; OOL  $1.7\text{--}1.9\times$  POL. Longitudinal diameter of eye (lateral view)  $1.4\text{--}1.5\times$  its transverse diameter; hind margins of eye and temple broadened downwards or subparallel. Face width about  $1.4\times$  combined height of face and clypeus. Longitudinal diameter of eye  $2.6\text{--}3.0\times$  longer than malar space (anterior view). Malar suture deep, smooth. Width of hypoclypeal depression  $1.1\text{--}1.2\times$  distance from depression to eye. Antenna  $1.1\text{--}1.2\times$  longer than fore wing, with 29–34 antennomeres. First, middle and penultimate flagellomeres  $2.2\text{--}2.3\times$ ,  $2.0\text{--}2.1\times$ , and  $2.0\text{--}2.2\times$  longer than wide, respectively. Mesosoma  $1.5\text{--}1.6\times$  longer than its maximum height. Mesoscutum setose only on notaulic area. Notauli impressed anteriorly, shallow posteriorly. Mesepimeral and metapleural sulci smooth. Propodeum without medio-longitudinal keel. Fore wing vein r arising from basal  $0.4\times$  of pterostigma; vein 1-R1 about  $1.3\times$  longer than pterostigma; marginal cell about  $5.2\times$  longer than distance from its apex to apex of wing; vein 3-SR  $2.3\text{--}2.5\times$  vein r, about  $0.6\times$



vein SR1,  $1.6\text{--}1.7\times$  vein 2-SR. Hind femur  $3.8\text{--}4.3\times$  longer than wide. Hind tibia with 1–2 thick setae subapically. Fifth segment of hind tarsus  $0.35\text{--}0.40\times$  as long as hind basitarsus,  $0.60\text{--}0.65\times$  as long as second segment. Claws with large, protruding and blunt basal lobes. First metasomal tergite without dorsal and dorsolateral carinae, its median length  $1.1\text{--}1.3\times$  its apical width. Second tergite with weak triangle median area and with very shallow s-shaped smooth dorsolateral impressions not bordered by carinae; medially  $0.93\text{--}0.97\times$  as long as third tergite; its basal width  $1.7\text{--}1.8\times$  its median length. Second metasomal suture deep, curved and smooth or weakly crenulate. Anterolateral margin of second metasomal tergite at most shortly desclerotised, apical margins of third to sixth tergites widely desclerotised. Ovipositor sheath about  $0.65\times$  as long as hind tibia, about  $0.2\times$  as long as fore wing. Apex of ovipositor with weak nodus and ventral serration. Head and mesosoma entirely smooth; first tergite weakly rugulose laterally and posteriorly, second and sometimes also third tergite weakly rugulose, but smooth on sides, fourth–fifth tergites hardly granulate to smooth. Body black or brown, legs and palps yellow, apex of hind tibia and hind tarsus brown; wing membrane weakly darkened, pterostigma and veins brown.

**Diagnosis.** Within the subgenus *Osculobracon* Papp, *Bracon cingillus* Tobias is most similar to *B. subcingillus* Tobias, 2000 because of the crenulated furrow of the first metasomal tergite, more or less complete absence of desclerotised areas in anterolateral margins of the second metasomal tergite, and development of sculpture on two basal tergites (Fig. 90). The differences between two species are listed below.

- |   |  |
|---|--|
| 1 | Median length of first metasomal tergite (measured from spiracle) $0.8\text{--}1.0\times$ its apical width (Fig. 90). Claws with large acutely protruding basal lobe. Mesosoma $1.5\text{--}1.6\times$ longer than its maximum height..... |
|   | ..... <i>Bracon (Osculobracon) cingillus</i> Tobias  |
| – | Median length of first metasomal tergite (measured from spiracle) $1.2\times$ its apical width. Claws with small weakly pointed basal lobe. Mesosoma $1.4\times$ longer than its maximum height.....                                       |
|   | ..... <i>Bracon (O.) subcingillus</i> Tobias   |

***Bracon (Rostrobracon) urinator* (Fabricius, 1798)**

Fig. A8

**Material.** SOUTH KOREA – **Jeju-do** • 1 female; Jeju-si, [89] Odeung-dong, Hanlla Mountain; 10 Aug. 1995; S.H. Lee leg.; NIBR 13.

**Distribution.** Afghanistan. Caucasus. Central Asia. China: Liaoning, Shaanxi, Shandong, Zhejiang. Cyprus. Europe: Eastern, Northern, Southern, and Western Europe. Iran. Israel. Kazakhstan. Mongolia. North Africa: Algeria, Canary Islands, Egypt, Tunisia. Russia: Eastern Siberia: Buryatia Republic, Zabaikalskiy Territory; European part; Far East: Primorskiy Territory; Ural (Kostromina 2010). Saudi Arabia. South Korea (new record). Syria. Turkey.

**Remarks.** *Rostrobracon* Tobias, 1957 is considered here a valid subgenus, because its synonymisation with *Cyanopterobracon* Tobias, 1957 was not justified (Papp 2012). On the contrary, the latter subgenus differs by the less elongate eyes, about 1.5× as long as wide in lateral view (in *Rostrobracon*, ca. 2×), the long malar space, ca. 0.5× longitudinal diameter of eye in anterior view (ca. 0.25×), the elongate, 1.3–1.6× as long as high, mesosoma (robust, 1.1–1.2× as long as high) with evenly convex median lobe of mesoscutum (the median lobe dorsally flattened in anterior part), the deep second metasomal suture (mostly shallow in *Rostrobracon*), and the shorter ovipositor sheath, ca. as long as hind tibia (ca. 2× as long as hind tibia in *Rostrobracon*).

***Bracon (Sculptobracon) obsoletus* Li, He & Chen, 2016**

Fig. A9

**Material.** SOUTH KOREA (23 females, 5 males). – **Gangwon-do** • 1 female; Goseong-gun, [1] Hyeonnae-myeon, Baebong-ri; 26 May 1993; D.-S. Ku leg.; SMNE 237 • 1 female; Goseong-gun, [3] Geojin-eup, Naengcheon-ri, Geonbongsa Temple; 25 May 1993; D.-S. Ku leg.; SMNE 238 • 1 female; Inje-gun, [9] Inje-eup, Hapgang-ri; 27 May 1993; D.-S. Ku leg.; SMNE 233 • 1 female; Donghae-si, [15] Bukpyeong-dong; 28 May 1993; D.-S. Ku leg.; SMNE 231 • 1 female; Yeongwol-gun, [18] Hanbando-myeon, Ssangyong-ri; 24 May 1993; D.-S. Ku leg.; ZISP 258. – **Gyeonggi-do** • 1 female; Paju-si, [28] Munsan-eup, Majeong-ri, Freedom Bridge (pond); 3 Jun. 1998; leg.; NIBR 236 • 1 male; Gapyeong-gun, [32] Cheongpyeong-myeon, Homyeong-ri, Cheongpyeong Dam; 14 Jun. 1992; D.-S. Ku leg.; SMNE 242 • 1 female; Suwon-si, [37] Gwonseon-gu, Seodun-dong, Yeogisan Mountain; 29 May – 6 Jul. 1994; D.-S. Ku leg.; Malaise trap; ZISP 239 • 1 female; same locality as in preceding; 16 Jun. 1994; J.Y. Choi leg.; 249; SMNE • 1 female; Suwon-si, [38] Gwonseon-gu, Seodun-dong; 5 Sep. 1986; Seong-Bok Ahn leg.; apricot; SMNE 248 • 5 females; same data as for preceding; 9 Oct. 1985; SMNE 244–247, 253 • 1 female; same locality as in preceding; 30 Jun. 1995; D.J. Im leg.; SMNE 250 • 1 male; same locality as in preceding; 7 Aug. 1996; Seong-Bok Ahn leg.; ZISP 251 • 3 males; same data as for preceding; SMNE 252, 254, 255 • 2 females; Hwaseong-si, [39] Bibong-myeon; 1 Jun. 1994; D.-S. Ku leg.; SMNE 234, 235. – **Gyeongsangbuk-do** • 1 female; Gimcheon-si, [45] Daedeok-myeon, Churyang-ri Sudosan Mountain; 1 Sep. 1995; June-Yeol Choi leg.; SMNE 243 • 1 female; Yeongcheon-si, [46] Hwabuk-myeon, Sangsong-ri, Nogwijae ridge; 29 May 1993; D.-S. Ku leg.; SMNE 232. – **Gyeongsangnam-do** • 2 females; Jinju-si, [73] Jinseong-myeon, Daesa-ri; 8 May 1993; D.-S. Ku leg.; SMNE 240, 241. – **Jeju-do** • 2 females; Seogwipo-si, [90] Andeok-myeon, Sanbangsan Mountain; 26 Aug. 1997; D.-S. Ku leg.; Tree Colony; SMNE 256, 257.

**Distribution.** China: Shanxi (Li et al. 2016). South Korea (new record).

**Remarks.** The detailed description and diagnosis of the species are provided in Li et al. (2016: 471).



**Genus *Campyloneurus* Szépligeti, 1900**

**Remarks.** Due to the recent discovery of the species with character states intermediate between *Acampyloneurus* van Achterberg and *Campyloneurus* Szépligeti (Li et al. 2020c) the taxonomic statuses and diagnoses of these genera require special revision. Here we consider the species previously classified as *Acampyloneurus* (Samartsev 2019) as the members of *Campyloneurus*, because they fit in the new range of variability of the latter genus.

***Campyloneurus bohayicus* (Belokobylskij, 2000), comb. nov.**

Fig. A10

**Material.** SOUTH KOREA – **Gyeongsangnam-do** • 1 female; Tongyeong-si, [78] Hansan-myeon, Bijin Island, Bijin-ri; 14–16 Sep. 1997; Pierre Tripotin leg.; Malaise trap; NIBR 525.

**Distribution.** Russia: Far East: Primorskiy Territory. South Korea (new record).

**Remarks.** The species has been re-described and its taxonomic position has been reviewed recently (Samartsev 2019). The species is very similar to *Campyloneurus pachypus* Li, van Achterberg & Chen, 2020, their differences are listed in diagnosis of the latter species.

***Campyloneurus pachypus* Li, van Achterberg & Chen, 2020**

Figs 93–98, A10

**Material.** SOUTH KOREA – **Gangwon-do** • 1 female; Hongcheon-gun, [12] Duchon-myeon; 11 Oct. 1995; J.Y. Choi leg.; NIBR 524.

**Distribution.** China (Li et al. 2020c): Hubei, Zhejiang. South Korea (new record).

**Description.** Character states from Li et al. (2020c) are given in parentheses. **Female.** Body length 4.7 mm (6.4–6.6 mm), fore wing length 4.8 mm. Transverse diameter of eye (dorsal view) 1.6× (2.1×) and (lateral view) 1.8× longer than temple. POL 1.4× Od (1×); OOL 2.5× Od (2×); OOL 1.8× POL (2×). Face width 1.2× (1.4×) combined height of face and clypeus, 2.0× width of hypoclypeal depression. Longitudinal diameter of eye 3.1× longer than malar space (anterior view). Malar suture absent. Scape (lateral view) 1.6× longer than maximum wide, longer ventrally, than dorsally, concave laterally. Mesosoma 1.6× (1.8×) longer than its maximum height. Notauli deep anteriorly, absent and not united posteriorly. Fore wing vein 1-R1 1.5× longer than pterostigma. Vein 3-SR 3.2× (3.3×) vein r, 0.63× (0.68×) vein SR1, 2.1× vein 2-SR. Vein 1-SR+M curved forward proximally. Wing membrane evenly setose in base of hind wing. Hind femur 3.7× (3.8×) longer than wide. Claws with moderate large rounded basal lobe. Median length of first metasomal tergite as large as its apical width (1.1× its apical width). Dorsal carinae of first metasomal tergite incomplete,

strongly curved towards apex; dorsolateral carinae developed. Second metasomal tergite medially 1.3× longer than third tergite; basal width of second tergite 1.4× larger than its median length; with long weakly converging sublateral carinae; without sublateral posteriorly diverging grooves. Anterolateral areas of second metasomal tergite elongate-triangular, very long, smooth, with sharp crenulate margins; median area of tergite strongly elevated, short and wide, transverse-triangle, with long narrow “tail” posteriorly; separated by sharp crenulate margin. Transverse subapical grooves absent on third tergite, incomplete on fourth tergite, and complete on fifth tergite, crenulate. Ovipositor sheath 0.95× as long as hind tibia, 0.3× (0.2×) as long as fore wing. Apex of ovipositor with developed nodus and ventral serration. Body mostly smooth; first metasomal tergite laterally weakly rugulose, its median area apically foveate-rugose; second tergite medially rugose, laterally smooth. Coloration mostly as in *Cyanopterus tricolor* (Ivanov), but tegula and fore legs entirely yellow and mesoscutum and scutellum rusty.

**Diagnosis.** The species is very similar to *Campyloneurus bohayicus* (Belokobylskij, 2000), their differences are listed below.

- |   |  |
|---|--|
| 1 | Scape about 2× longer than maximum wide (Samartsev 2019: fig. 24). Head black. Apex of ovipositor without nodus and ventral serration, simple and acute (ibid: fig. 24). Face more or less granulate (ibid: fig. 5). Hind wing membrane proximally with sparse setosity near vein cu-a (ibid: fig. 25). Anterolateral areas of second metasomal tergite elongate-triangular, but less long (ibid: fig. 14) ..... <b><i>Campyloneurus bohayicus</i> (Belokobylskij)</b>   |
| – | Scape about 1.5× longer than maximum wide (Fig. 96; Li et al. 2020c: fig. 16K). Head rusty. Apex of ovipositor with well-developed nodus and ventral serration (Fig. 97; Li et al. 2020c: fig. 16i). Face smooth (Fig. 94; Li et al. 2020c: 16g). Hind wing membrane proximally evenly setose (Fig. 93; Li et al. 2020c: 16b). Anterolateral areas of second metasomal tergite elongate-triangular, very long (Fig. 94; Li et al. 2020c: fig. 16e) .....<br>..... <b><i>Campyloneurus pachypus</i> Li, van Achterberg &amp; Chen</b> |

***Campyloneurus penini* (Belokobylskij, 2000), comb. nov.**

Fig. A10

**Material.** SOUTH KOREA (1 female, 3 males). – **Gangwon-do** • 1 female; Hongcheon-gun, [13] Naechon-myeon, Waya-ri, Baegamsan Mountain; 1 Sep. – 18 Oct. 2002; D.-S. Ku leg.; Malaise trap; SMNE 526 • 1 male; Yeongwol-gun, [18] Hanbandomyeon, Ssangyong-ri; 24 May 1993; D.-S. Ku leg.; NIBR 529 • 1 male; same data as for preceding; ZISP 528. – **Chungcheongbuk-do** • 1 male; Goesan-gun, [59] Cheongcheon-myeon, Sagimak-ri; 23 May 1993; D.-S. Ku leg.; SMNE 527.

**Distribution.** Russia: Far East: Primorskiy Territory. South Korea (new record).

**Remarks.** The taxonomic position of the species has been reviewed recently (Samartsev 2019).



## Genus *Craspedolcus* Enderlein, 1920

### *Craspedolcus kurentzovi* (Belokobylskij, 1986)

Fig. A10

**Material.** SOUTH KOREA – **Gyeonggi-do** • 1 female; Gunpo-si, [35] Sokdal-dong, Surisan Mountain; 10 Jun. 1998; Hyong-Kun Lee leg.; light trap; NIBR 817.

**Distribution.** Japan: Shikoku (Belokobylskij and Tobias 2000). Russia: Far East: Primorskiy Territory. South Korea (new record).

**Remarks.** The taxonomic position of the species has been reviewed recently (Samartsev 2019).

## Genus *Cyanopterus* Haliday, 1835

### *Cyanopterus tricolor* (Ivanov, 1896)

Figs 99–104, A10

**Material.** SOUTH KOREA (4 females, 2 males). – **Gangwon-do** • 1 female; Yangyang-gun, [10] Seo-myeon, Galcheon-ri, Yaksusan Mountain; 9 Aug. 1989; K.T. Park leg.; NIBR 517 • 1 female; Hongcheon-gun, [13] Naechon-myeon, Waya-ri, Baegamsan Mountain; 31 Jul. 2002; D.-S. Ku leg.; light trap; ZISP 515 • 1 male; Hoengseong-gun, [16] Gonggeun-myeon, Hakdam-ri; 24 May 1993; D.-S. Ku leg.; SMNE 518. – **Gyeongsangbuk-do** • 1 female; Gyeongsan-si, [49] Yeongnam University, Department of Biology; 19 Jun. 199?; S.K. Lee leg.; SMNE 516. – **Chungcheongbuk-do** • 1 male; Goesan-gun, [59] Cheongcheon-myeon, Sagimak-ri; 23 May 1993; D.-S. Ku leg.; ZISP 519. – **Gyeongsangnam-do** • 1 female; Jinju-si, [75] Neadong-myeon, Doksan-ri (Around the forest road); 5–20 May 2003; Tea-Ho Ahn leg.; Malaise trap; SMNE HYM-BRA\_ATH\_0000150.

**Additional material.** UKRAINE • 1 male (lectotype); Kupyansk; 23 May 1895; P.V. Ivanov leg.; blackthorn; ZISP.

RUSSIA – **Primorskiy Territory** • 1 female; Khasansky District, 30 km S of Slavyanka; 3 Aug. 1985; S.A. Belokobylskij leg.; oak forest, hazel grove; ZISP B0075 • 1 female; Mikhaylovsky District, Tarasovka; 24 Jul. 1972; L. Kulikova leg.; flowers, soybean, wheat; ZISP B0077 • 1 female; Spassky District, Spassk-Dalny; 17 May – 21 Jun. 1996; S.A. Belokobylskij leg.; shrubs, forest; ZISP B0076.

**Distribution.** China (Cao et al. 2020): Jilin, Liaoning. Eastern Europe. Russia: European part; Far East: Jewish Autonomous Province, Primorskiy Territory; Western Siberia (Belokobylskij and Tobias 2000). South Korea (new record).

**Description. Female.** Body length 4.1–5.8 mm, fore wing length 4.3–6.2 mm. Transverse diameter of eye (dorsal and lateral view) 1.1–1.4× longer than temple. POL 1.1–1.3× Od. OOL 2.5–2.8× Od. OOL 1.9–2.4× POL. Face width 1.2–1.5× combined height of face and clypeus, 1.9–2.0× width of hypoclypeal depression. Longitudinal diameter of eye 2.2–2.7× longer than malar space (anterior view).



**Figures 93–104.** *Campyloneurus pachypus* Li, van Achterberg & Chen, 2020 (99–104 female, NIBR) and *Cyanopterus tricolor* (Ivanov, 1896) (99–104 female, ZISP) **93, 99** habitus, lateral view **94, 101** head, anterior view **95, 104** head, dorsal view **96** scape, lateral view **97, 100** apex of ovipositor **98** metasoma, dorsolateral view **102** head, lateral view **103** mesosoma, dorsal view. Scale bars: 0.25 mm (**96, 97**); 0.5 mm (**94, 95, 100–104**); 1 mm (**93, 98, 99**).

Malar suture absent. Scape (lateral view) as long dorsally as ventrally, concave laterally. Mesosoma 1.5–1.7× longer than its maximum height. Notauli impressed anteriorly, shallow and not united posteriorly. Fore wing vein 1-R1 1.4–1.8× longer than pterostigma. Marginal cell 5.5–6.6× longer than distance from its apex to apex of wing. Vein 3-SR 3.5–3.9× vein r. Vein 3-SR 0.50–0.70× vein SR1. Vein 3-SR 1.8–2.3× vein 2-SR. Vein 1-SR+M weakly curved forward proximally. Wing membrane evenly setose in base of hind wing. Hind femur 3.2–3.4× longer than wide. Claws with moderately large rounded basal lobe. Median length of first tergite 1.0–1.2× its apical width. Dorsal carinae of first metasomal tergite absent; dorsolateral carinae weakly separated. Second metasomal tergite medially 1.25–1.30× as long as third tergite; with long parallel sublateral carinae and anterolateral, posteriorly diverging sublateral crenulated grooves; basal width of second tergite 1.4–1.6× its median length. Anterolateral areas of second metasomal tergite elongate-triangular,



strongly separated by crenulate furrows and sharp crenulate margins; median area of tergite strongly elevated, triangle, large and wide, rounded on sides, separated by crenulate furrows and complete sharp margin. Apical margins of third to sixth tergites without transverse subapical grooves. Ovipositor sheath about 1.5× longer than hind tibia, 0.41–0.46× as long as fore wing. Apex of ovipositor without distinct nodus, acute; with weak or more or less developed ventral serration. Body entirely smooth, only first metasomal tergite sometimes foveate-rugose apicomediaally. Body mostly brownish black; head, prothorax (often also mesoscutum), tegulae and pattern on fore leg reddish yellow; maxillary palps yellow; wing membrane brownish darkened; pterostigma and wing veins brown; membranous areas of metasomal sterna pale yellow.

**Diagnosis.** *Cyanopterus tricolor* differs from similar species (*C. hinoemataensis*, *C. kusarensis*, and *C. praecinctus*) by the relatively long ovipositor (in related species it is 0.85–1.00× and 0.2–0.3× as long as hind tibia and fore wing, respectively) and absence of transverse subapical grooves on third–fifth metasomal tergites.

### Genus *Iphiaulax* Foerster, 1863

#### *Iphiaulax mactator* (Klug, 1817)

Fig. A11

**Material.** SOUTH KOREA (1 female, 1 male). – **Gangwon-do** • 1 male; Yanggu-gun, [8] Bangsan-myeon, Omi-ri; 13 Jun. 1992; D.-S. Ku leg.; NIBR79. – **Seoul-si** • 1 female; Gwanak-gu, [23] Shinrim-dong; 29 Jun. 1973; H.-M. Kim leg.; SMNE78.

**Distribution.** Caucasus. China: Henan, Hunan (Li et al. 2020c), Inner Mongolia (Li et al. 2020c), Jilin. Europe: Eastern, Southern, and Western Europe. Iran. Kazakhstan. Mongolia. Russia: Eastern Siberia: Buryatia Republic, Zabaikalskiy Territory; European part; Far East: Amur Province, Jewish Autonomous Province, Primorskiy Territory. South Korea (new record). Turkey.

**Remarks.** See Li et al. (2020c) for the diagnosis of the species.

#### *Iphiaulax wuhainensis* Wang & Chen, 2008

Figs 105–109, A11

**Material.** SOUTH KOREA (9 females, 14 males) • 2 females; without explicit locality [“白桥” = 白橋, (“White Bridge”)]; 9 Aug. 1957; SMNE 65, 66. – **Gangwon-do** • 1 male; Yanggu-gun, [8] Bangsan-myeon, Omi-ri; 13 Jun. 1992; D.-S. Ku leg.; SMNE 474. – **Chungcheongbuk-do** • 1 male; Okcheon-gun, [62] Iwon-myeon, Iwon-ri; 22 May 1993; D.-S. Ku leg.; SMNE 491. – **Gyeongsangnam-do** • 1 female; Uiryeong-gun, [67] Garye-myeon, Gapeul-ri, Jagulsan Mountain; 21 Jul. 1992; D.-S. Ku leg.; SMNE 473 • 1 male; Changwon-si, [68] Masanhappo-

gu, Jinbuk-myeon, Yeonghak-ri, Seobuk Mountain; 20 Jul. 1992; D.-S. Ku leg.; SMNE 475 • 1 male; Jinju-si, [71] Daepyeong-myeon, Naechon-ri; 4 Jul. 1992; D.-S. Ku leg.; SMNE 487 • 2 females; Jinju-si, [72] Gajwa-dong; 16 Jun. 1993; D.-S. Ku leg.; NIBR 476, 477 • 2 females; same data as for preceding; SMNE 478, 479 • 2 males; same data as for preceding; SMNE 480, 481 • 1 male; same data as for preceding; 19 Jun. 1993; SMNE 486 • 1 male; same data as for preceding; 9 Jun. 1993; ZISP 489 • 1 male; same data as for preceding; SMNE 490 • 1 female; same data as for preceding; 22 Aug. 1993; SMNE 488 • 1 male; Jinju-si, [75] Neadong-myeon, Doksan-ri (Around the forest road); 1 Jun. 2003; Tea-Ho Ahn leg.; sweeping; SMNE HYM-BRA\_ATH\_0000675 • 1 male; Jinju-si, [76] Geumgok-myeon; 26 May 1984; S.J. Choi leg.; SMNE 485 • 1 male; same data as for preceding; 1 Jun. 1984; SMNE 484 • 2 males; same data as for preceding; 21 Jun. 1984; SMNE 482, 483 • 1 female; same locality as in preceding; 16 Jun. 1985; G.J. Jeong leg.; ZISP 472.

**Additional material.** CHINA – **Liaoning** • 1 female; Shenyang; 1 Jul. 1952; I.A. Rubtsov leg.; ZISP.

**Distribution.** China: Inner Mongolia, also presumably Beijing, Liaoning, Shaanxi, Shandong, Zhejiang (see remarks). South Korea (new record).

**Description. Female.** Body length 5–8 mm; fore wing length 5–7 mm. Width of head (dorsal view)  $1.5\text{--}1.7\times$  its median length. Transverse diameter of eye (dorsal view)  $1.3\text{--}1.4\times$  and longer than temple. OOL  $3.1\text{--}3.7\times$  Od; POL  $1.5\text{--}1.8\times$  Od; OOL  $1.9\text{--}2.2\times$  POL. Face width  $1.5\text{--}1.6\times$  combined height of face and clypeus;  $2.2\text{--}2.5\times$  larger than width of hypoclypeal depression. Longitudinal diameter of eye  $1.7\text{--}1.8\times$  longer than malar space (anterior view). Malar suture weakly impressed (sometimes more deep under eye), weakly crenulate and densely setose. Antenna with 47–61 antennomeres. Scape (lateral view) longer ventrally than dorsally, somewhat swollen. First, middle and penultimate flagellomeres  $1.5\text{--}1.8\times$ , about  $1.3\times$ , and  $1.4\text{--}1.6\times$  longer than wide, respectively. Apical flagellomere weakly pointed, apically with flat inclined area. Mesosoma  $1.8\text{--}1.9\times$  longer than its maximum height. Notauli deep anteriorly, absent and not united posteriorly. Mesoscutum setose only on notaulic area. Mesepimeral and metapleural sulci smooth, mesopleural pit indistinct. Fore wing vein 1-R1  $1.2\text{--}1.4\times$  longer than pterostigma; marginal cell  $2.7\text{--}3.6\times$  longer than distance from its apex to apex of wing. Vein 3-SR  $2.9\text{--}3.3\times$  vein r,  $0.53\text{--}0.63\times$  vein SR1,  $1.7\text{--}2.1\times$  vein 2-SR. Wing membrane evenly setose in base of hind wing. Hind femur  $3.3\text{--}4.0\times$  longer than wide. Claws with moderately large rounded basal lobe. Median length of first tergite  $1.1\text{--}1.3\times$  its apical width. Dorsolateral carinae of first metasomal tergite absent or weakly separated (sometimes only behind spiracle), dorsal carinae absent. Second tergite medially about  $1.2\times$  longer than third tergite; with deeply impressed anteriorly and very shallow posteriorly, smooth s-shaped dorsolateral longitudinal impressions and with anterolateral posteriorly diverging deep smooth furrows; basal width of second metasomal tergite  $1.2\text{--}1.5\times$  larger than its median length. Apical margins of third to sixth tergites thick, without transverse subapical grooves. Ovipositor sheath



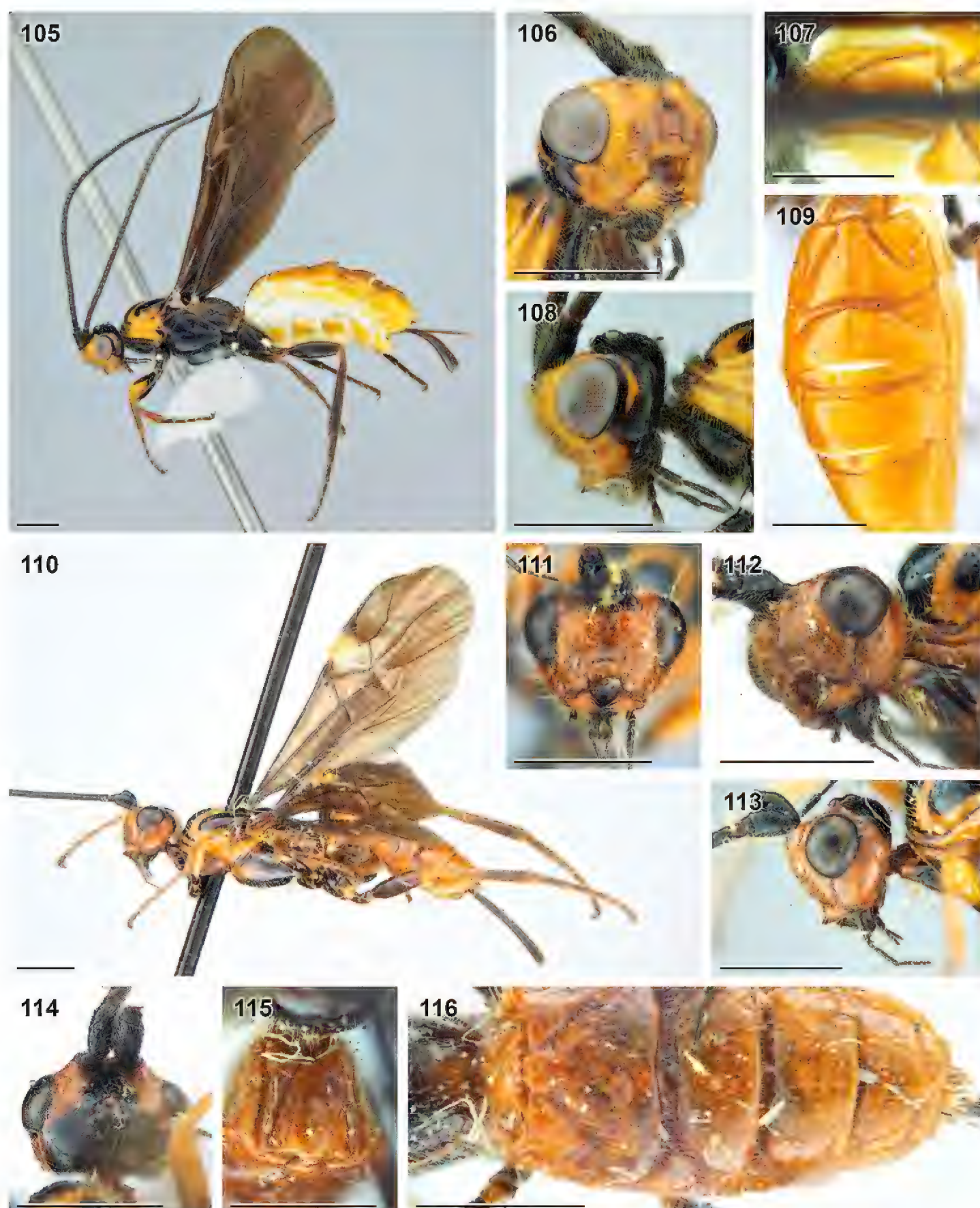
0.80–1.05× as long as hind tibia and 0.24–0.30× as long as fore wing. Apex of ovipositor with weakly widened blunt upper valve and weakly developed or absent ventral serration. Body entirely smooth. Head, mesosoma and legs mainly brownish black, metasoma reddish yellow. Face, anterior and posterior margins of eye, lateral sides of pronotum, mesoscutum along notauli, apex of fore femur, and base of fore tibia reddish yellow. Maxillary palps brownish black, tegulae dark brown. Wing membrane deeply darkened, somewhat lighter apically; pterostigma brown, sometimes with small yellowish patch basally, wing veins dark brown.

**Male.** Body length 4.0–5.5 mm; fore wing length 4.3–5.5 mm. Antenna with 41–51 antennomeres. First flagellomere 1.8–2.2× longer than its apical width. Mesosoma 1.9–2.1× longer than its maximum height. Vein 3-SR 2.9–3.8× vein r. Hind femur 3.6–4.6× longer than wide. Furrows on metasoma weakly crenulate. Basal width of second metasomal tergite 1.0–1.2× larger than its median length. Second tergite sometimes weakly and sparsely foveate. Apex of metasoma with brownish black patch.

**Diagnosis.** *Iphiaulax wuhainensis* is very similar to *I. impeditor* (Kokujev, 1898) distributed in Europe, Caucasus, Western and Central Asia (including Kazakhstan), Western Siberia, and Krasnoyarsk Territory in Eastern Siberia. Two taxa may represent two subspecies or geographical varieties of one species. The differences between *I. wuhainensis* and *I. impeditor* are presented below.

- |   |  |
|---|--|
| 1 | Pterostigma yellow with brown patch apically (Fig. 110). Anterolateral areas of second–fifth metasomal tergites separated by crenulate furrows (Fig. 116). Second tergite with smoothed foveate sculpture; first tergite laterally weakly rugulose (Fig. 115). Malar suture deep, sparsely setose (Figs 112, 113). Mesopleural pit deep and separated from mesepimeral sulcus. Marginal cell 2.2–2.4× longer than distance from its apex to apex of wing.....<br>..... <i>Iphiaulax impeditor</i> (Kokujev)                |
| – | Pterostigma brown, sometimes with small yellowish patch basally (Fig. 105). Anterolateral areas of second–fifth metasomal tergites separated by smooth furrows (Fig. 109). Second tergite smooth (sometimes only with sparse narrow punctures); first metasomal tergite laterally smooth (Fig. 107). Malar suture weakly impressed, densely setose (Fig. 106). Mesopleural pit indistinct. Marginal cell 2.7–3.6× longer than distance from its apex to apex of wing....<br>..... <i>Iphiaulax wuhainensis</i> Wang & Chen |

**Remarks.** Two of three works indicating *Iphiaulax impeditor* in China (Wang et al. 2008; Li et al. 2020c) list mostly the same material. Both works do not indicate the most distinct differences between *I. impeditor* and *I. wuhainensis*, the coloration of the pterostigma and sculpture of metasoma. In addition, the pictures of *I. impeditor* in Li et al. (2020c: figs 33, 34) obviously represent a specimen of *I. wuhainensis*. Thus, both indications of *I. impeditor* in China are doubtful and likely belong to *I. wuhainensis*. *I. impeditor* has been also listed for the north-east part of China (Liaoning: Tobias and



**Figures 105–116.** *Iphiaulax wuhainensis* Wang & Chen, 2008 (105–109 female, NIBR) and *Iphiaulax impeditor* (Kokujev, 1898) (110–116 lectotype, female, ZISP) 105, 110 habitus, lateral view 106, 112 head, ventrolateral view 107, 115 first metasomal tergite, dorsal view 108, 113 head, lateral view 109 metasoma, dorsolateral view 111 head, anterior view 114 head, dorsal view 116 metasoma, dorsal view. Scale bars: 1 mm.

Belokobylskij 2000). This indication is based on a single specimen in the collection of ZISP (the label is cited above in the additional material for the species), which also belongs to *I. wuhainensis*.



**Genus *Syntomernus* Enderlein, 1920*****Syntomernus asphondyliae* (Watanabe, 1940)**

Fig. A11

**Material.** SOUTH KOREA (4 females, 2 males). – **Gangwon-do** • 1 female; Goseong-gun, [2] Ganseong-eup; 25 May 1993; D.-S. Ku leg.; NIBR 464 • 2 males; same data as for preceding; SMNE 465, 466. – **Gyeongsangnam-do** • 2 females; Hamyang-gun, [66] Macheon-myeon; 1 Sep. 2016; Heung-Yoon Oh leg.; from silver vine (*Actinidia polygama*) gall; NIBR • 1 female; same data as for preceding; ZISP.

**Distribution.** Japan: Honshu, Kyushu. Russia: Far East: Khabarovsk Territory, Primorskiy Territory. South Korea (new record).

**Remarks.** *Bracon flaccus* Papp, 1996 described from North Korea used to be considered a synonym of *Syntomernus asphondyliae* (Watanabe) (Tobias and Belokobylskij 2000), but recently has been synonymised with *S. sunosei* (Maeto, 1991) (Samartsev and Ku 2020). The key to the Eastern-Palaearctic species of *Syntomernus* is given in Samartsev and Ku (2020: 34).

***Syntomernus tamabae* (Maeto, 1991)**

Fig. A12

**Material.** SOUTH KOREA (1 female, 4 males). – **Gangwon-do** • 2 males; Sokcho-si, [6] Nohak-dong; 11 Jun. 1992; D.-S. Ku leg.; SMNE 470, 471 • 1 male; Inje-gun, [9] Inje-eup, Hapgang-ri; 27 May 1993; D.-S. Ku leg.; NIBR 468. – **Chungcheongnam-do** • 1 female; Geumsan-gun, [53] Chubu-myeon, Seongdang-ri, Gaedeoksa Temple; 22 May 1993; D.-S. Ku leg.; SMNE 467. – **Jeollanam-do** • 1 male; Yeosu-si, [86] Nam-myeon, Geumodo Island, Uhak-ri; 19 Jul. 1993; D.-S. Ku leg.; SMNE 469.

**Distribution.** Japan: Honshu, Kyushu, Ryukyu, Shikoku. South Korea (new record).

**Remarks.** The key to the Eastern-Palaearctic species of *Syntomernus* is provided by Samartsev and Ku (2020: 34).

**Genus *Uncobracon* Papp, 1996**

**Remarks.** *Uncobracon* has been considered either a separate genus (Papp 1996: 168; Tan et al. 2012: 64) or a subgenus of the genus *Bracon* (Tobias and Belokobylskij 2000: 119; Lee et al 2020b: 242). We follow the first point of view as more justified.

***Uncobracon belokobylskii* Samartsev, 2018**

Fig. A12

**Material.** SOUTH KOREA (4 females, 1 male). – **Gyeonggi-do** • 1 female; Pocheon-si, [25] Yeongbuk-myeon, Sanjeong-ri, Lake Sanjeong; 14 Jun. 1992; D.-S. Ku leg.; SMNE 443 • 1 male; Gapyeong-gun, [30] Buk-myeon, Dodae-ri, Myeongjisan Mountain; 14 Jun. 1992; D.-S. Ku leg.; SMNE 1681 • 1 female; Suwon-si, [37] Gwonseon-gu, Seodun-dong, Yeogisan Mountain; 23–29 Jun. 1994; D.-S. Ku leg.; Malaise trap; SMNE 444. – **Gyeongsangnam-do** • 1 female; Jinju-si, [72] Gajwa-dong; 16 Jun. 1993; D.-S. Ku leg.; NIBR 445. – **Jeollanam-do** • 1 female; Yeosu-si, [84] Nam-myeon, Dumo-ri, Town Moha; 20 Jul. 1993; D.-S. Ku leg.; SMNE 442.

**Distribution.** Russia: Far East: Primorskiy Territory (Samartsev 2018). South Korea (new record).

**Remarks.** The diagnosis of the species is provided in Samartsev (2018).

***Uncobracon tricoloratus* (Tobias, 2000)**

Fig. A12

**Material.** SOUTH KOREA – **Jeollanam-do** • 1 female; Yeosu-si, [87] Nam-myeon, Ando Island, Ando-ri; 4 Aug. 1993; D.-S. Ku leg.; NIBR 930.

**Distribution.** China: Zhejiang (Li et al. 2020c). Russia: Far East: Primorskiy Territory. South Korea (new record).

**Remarks.** The keys to the species of *Uncobracon* is presented in Samartsev (2018) and Li et al. (2020c).

**Discussion**

This article includes 31 species new to the fauna of the Korean Peninsula, most of which (21 species) have relatively narrow distribution restricted to some regions of China, the Russian Far East, and Japan. Almost all (18) of these Eastern-Palaearctic species were described in 2000 or later and known only by the description or by two works. Therefore, it is too early to discuss the patterns of distribution of these taxa. It is worth noticing the finding of *Iphiaulax wuhainensis* (from North, Northeast, and East China and South Korea), that is extremely close to *I. impeditor* distributed from Eastern Europe to Eastern Siberia. Two species are very close and differ mostly by the coloration pattern and development of the body sculpture, but these differences appear to be persistent and the known ranges of the two taxa do not overlap witnessing to the valid status of *I. wuhainensis*.

The minority of indicated species have been known for a long time as widespread taxa, but have not been recorded in the Korean Peninsula. These are the species with



wide Transpalearctic distribution, i.e. *Atanycolus ivanowi*, *Bracon* (*Habrobracon*) *nigricans*, *B.* (*Rostrobracon*) *urinator*, *Cyanopterus tricolor*, and *Iphiaulax mactator*, and the Holarctic *B.* (*H.*) *stabilis*. The rest of the species, *Bracon* (*Bracon*) *albion*, *B.* (*B.*) *longigenis*, *B.* (*B.*) *subcylindricus*, and *B.* (*B.*) *virgatus*, have been known only from the western part of the Palearctic region, and their occurrence in South Korea is quite unexpected. The latter mentioned species, even though it was described from Europe, has the habitus more characteristic of the Far Eastern members of *Bracon* (the metasoma with areolate sculpture and pale yellow medio-longitudinal stripe and the setose middle lobe of mesoscutum) and shows no related species known in the West Palearctic.

Current investigation is carried out on the basis of ca. 1800 specimens of Braconinae from the Korean Peninsula stored in the collections of SMNE, NIBR, and ZISP. We have published the results of study of about 35% of this material (in Samartsev and Ku 2020 and current paper). New distributional and taxonomic data added connections between the faunas of East-Asian countries, which seem too disconnected because they for a long time were separately investigated by different scientists and still are understudied. In addition, the conducted work allowed us to provide illustrated diagnoses for 16 complicated in identification species of Braconinae, most of which were described in a scarcely illustrated key in Russian (Tobias and Belokobylskij 2000). Providing relevant diagnostic information on the known East Palearctic braconines makes them accessible for identification, that is essential in current period, when the fauna of East Asia is becoming intensively investigated.

Most of the unpublished material from South Korea available for us is represented by the taxa similar to widespread species, mostly of the genus *Bracon*. Identification of this material is difficult, because it requires the involvement of many additional taxa from the West Palearctic. Nevertheless, we are aimed to finish this work by publishing a review of the fauna of the Korean Peninsula with an analysis of its composition and ties with neighboring regions and keys to species.

## Acknowledgements

We are deeply thankful to Cornelis van Achterberg (RMNH), Yvonnick Gérard (IRSNB), Christer Hansson (ZMLU), and Zoltán Vas (HNHM) for the opportunities to study the necessary type material, to Yang Li (Chengdu Normal University, Chengdu, China) for the pictures of several types and help with translating the labels in Chinese, and to Kyoungim Kim (SMNE) and Julia Samartseva (ZISP) for the help with arranging data. We also thank C. van Achterberg and two reviewers, Yang Li and Estefany Karen López-Estrada, for the examination of the manuscript and helpful criticism and corrections. This work was supported by a grant from the National Institute of Biological Resources (NIBR) funded by the Ministry of Environment (MOE) of the Republic of Korea (NIBR201902205 and NIBR202102204); participation of KS was partly performed in the frames of the state research project No AAAA-A19-119020690101-6 and supported by the Russian Foundation for Basic Research (grant No 19-04-00027).

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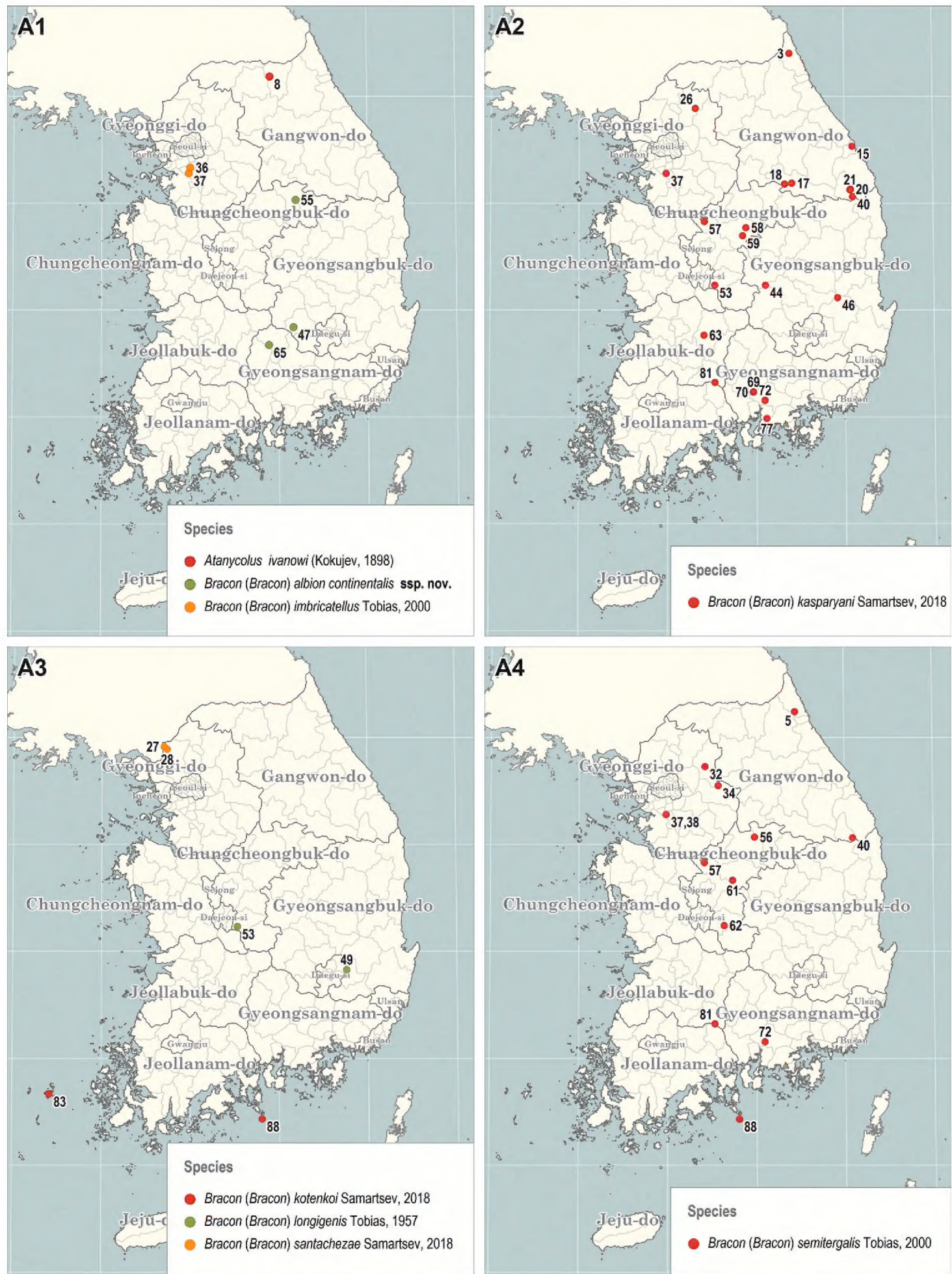
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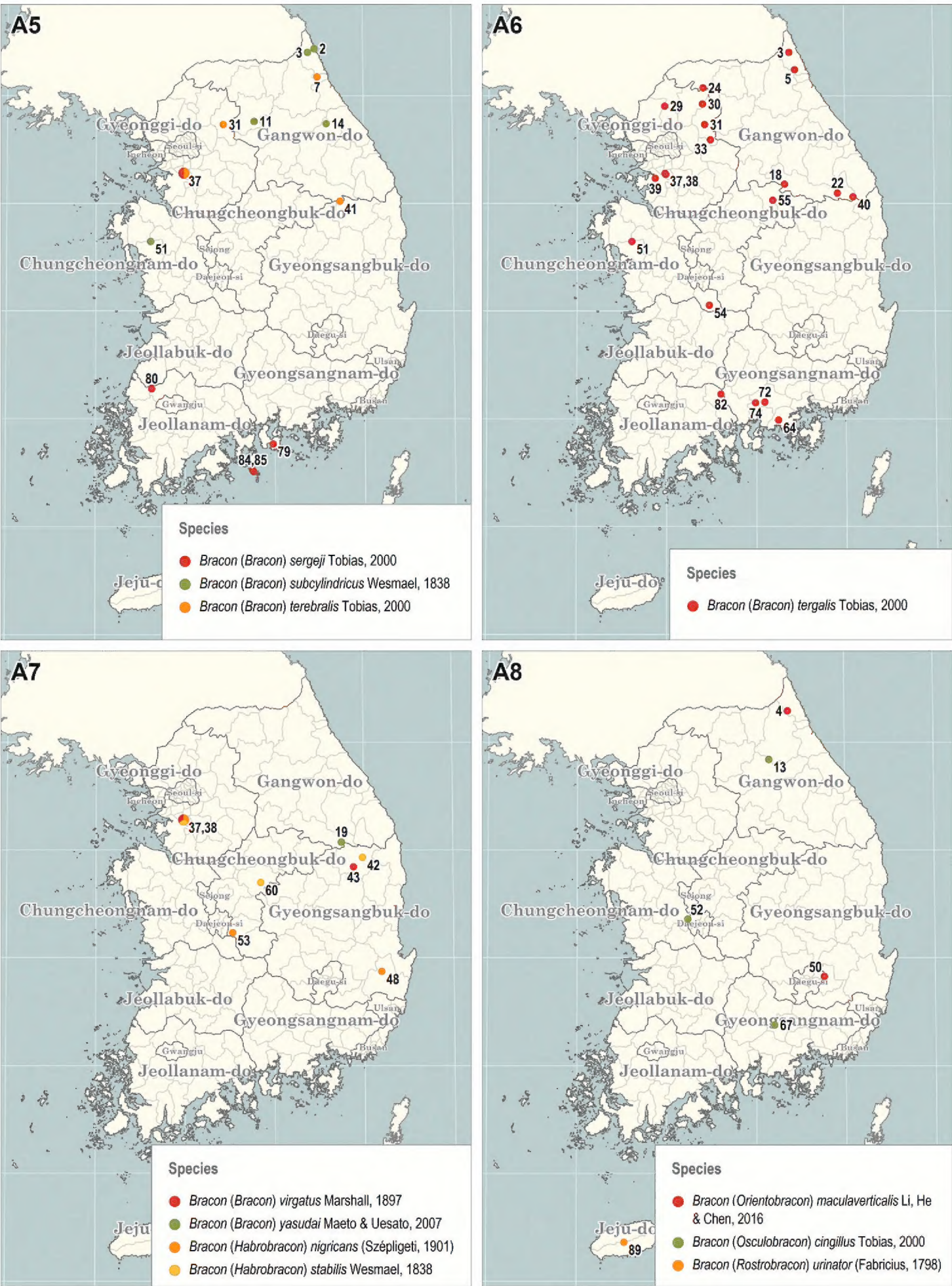


## Appendix I



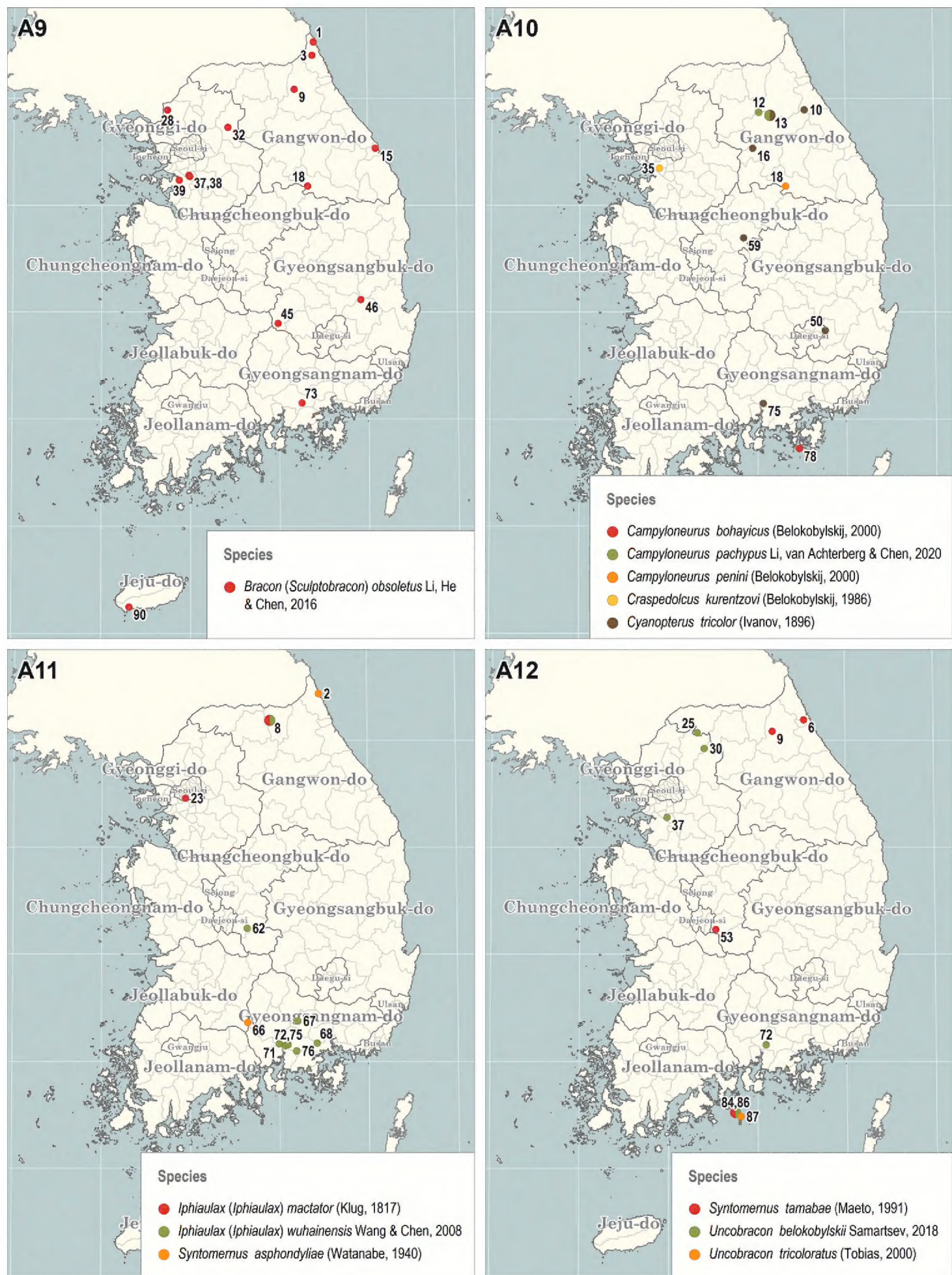
**Figures A1–A4.** Collecting localities of the material on the species new to South Korea. Point numbers correspond with numbers in brackets in text.





**Figures A5–A8.** Collecting localities of the material on the species new to South Korea. Point numbers correspond with numbers in brackets in text.





**Figures A9–A12.** Collecting localities of the material on the species new to South Korea. Point numbers correspond with numbers in brackets in text.